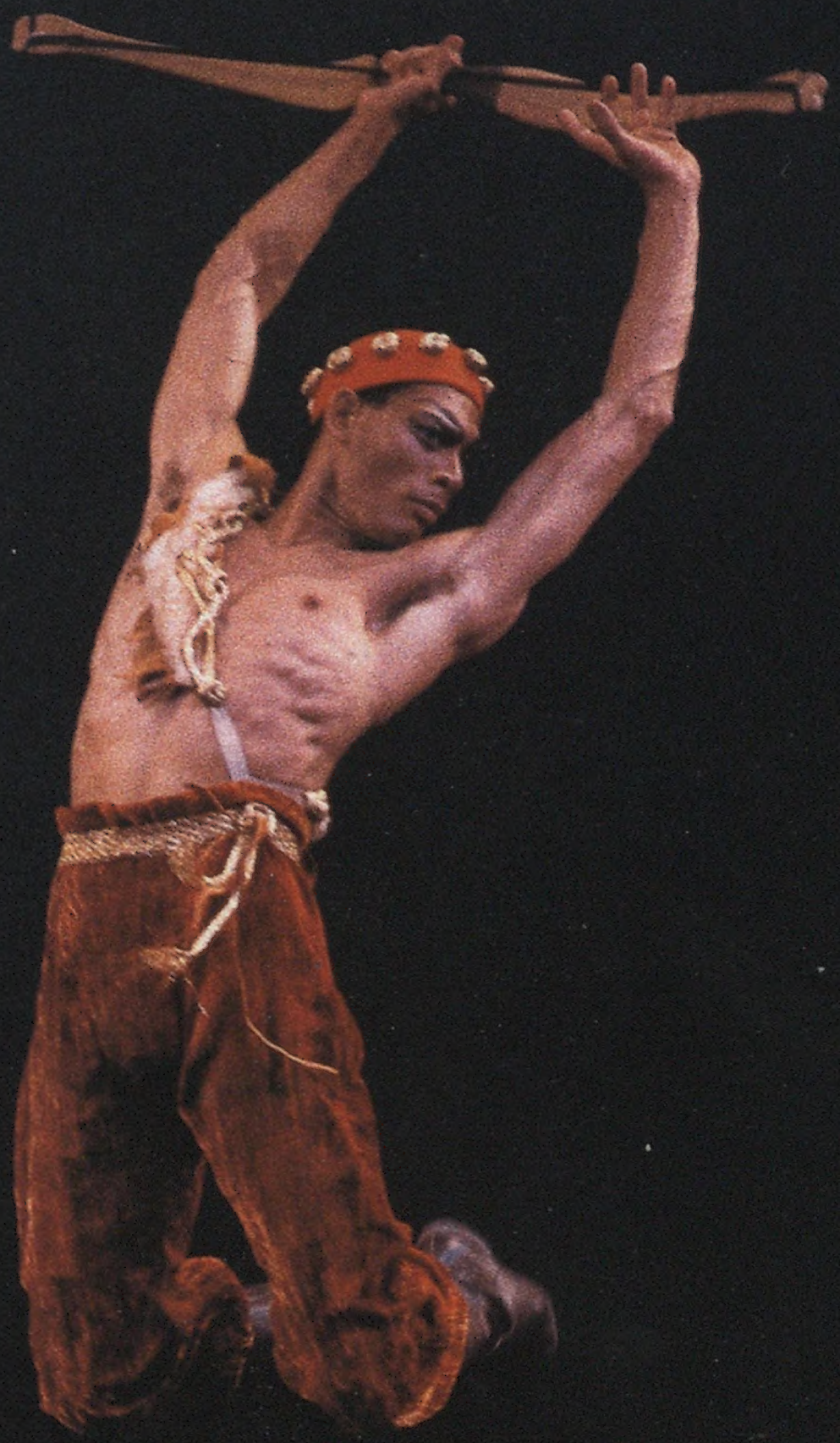
Smithsonian

July 1988



Flying high with
the Dance Theatre
of Harlem (p. 28)

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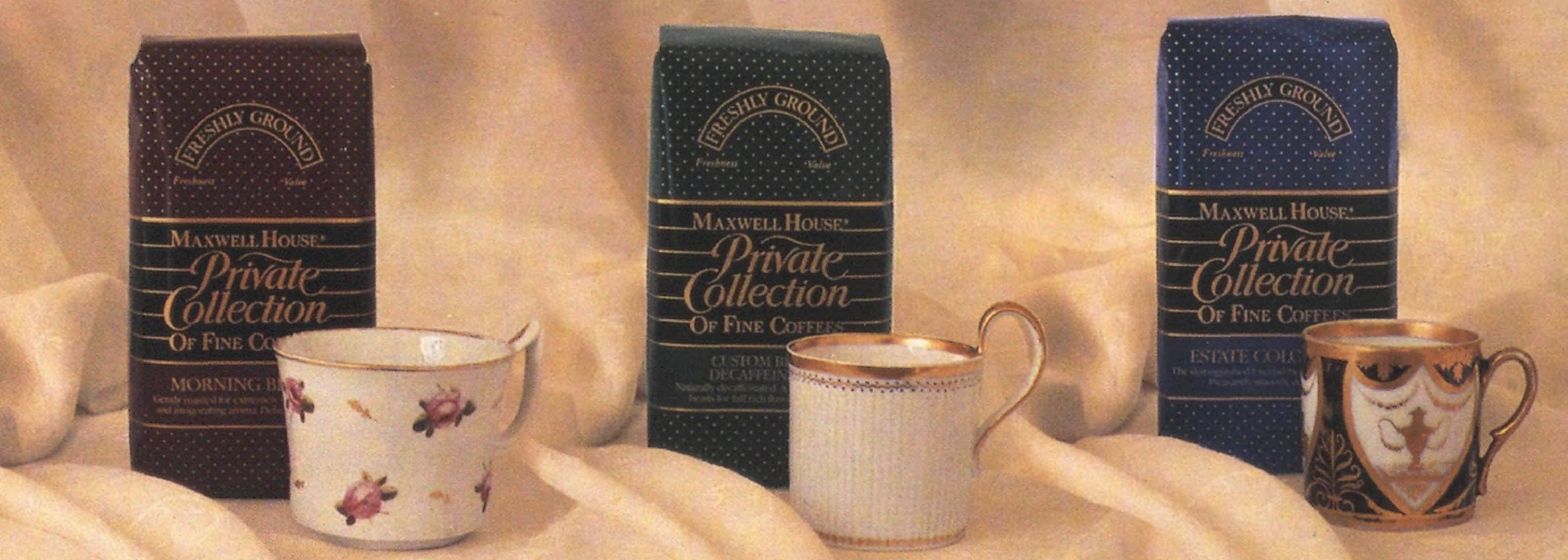

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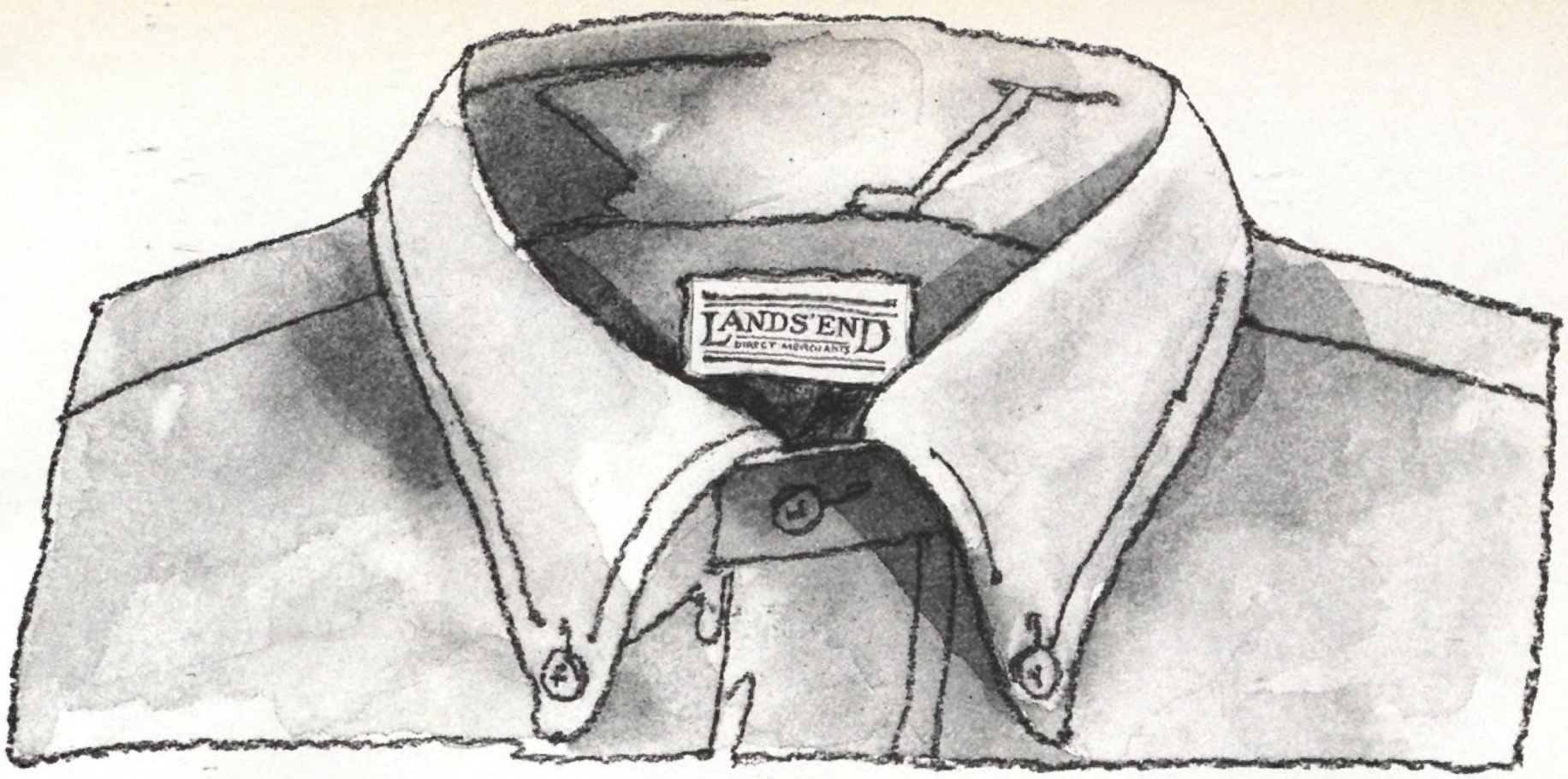

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July 1988

Smithsonian

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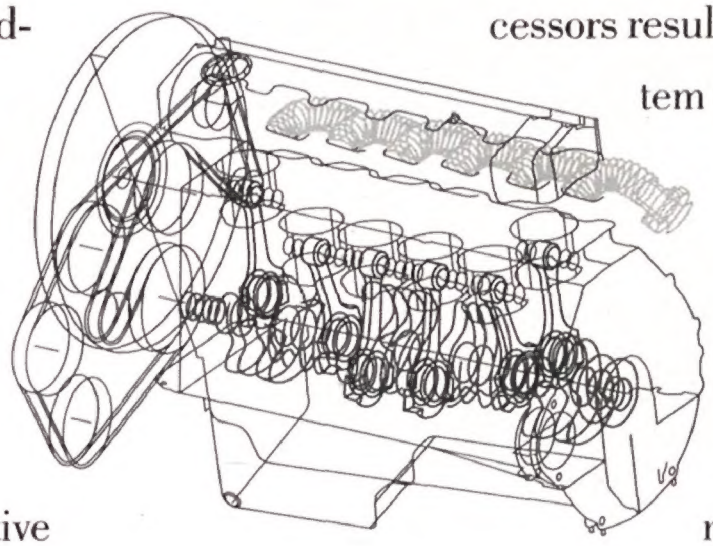

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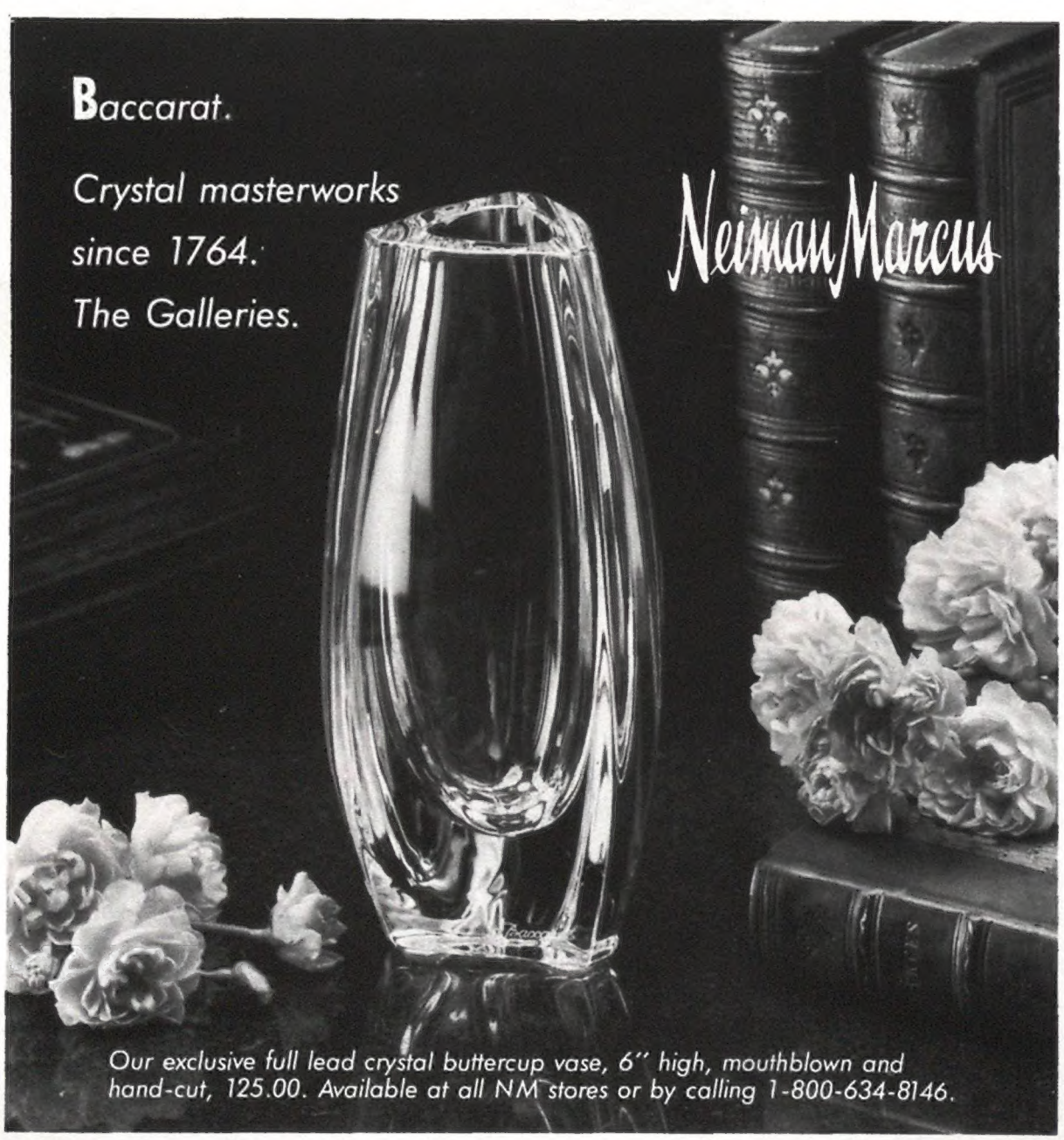
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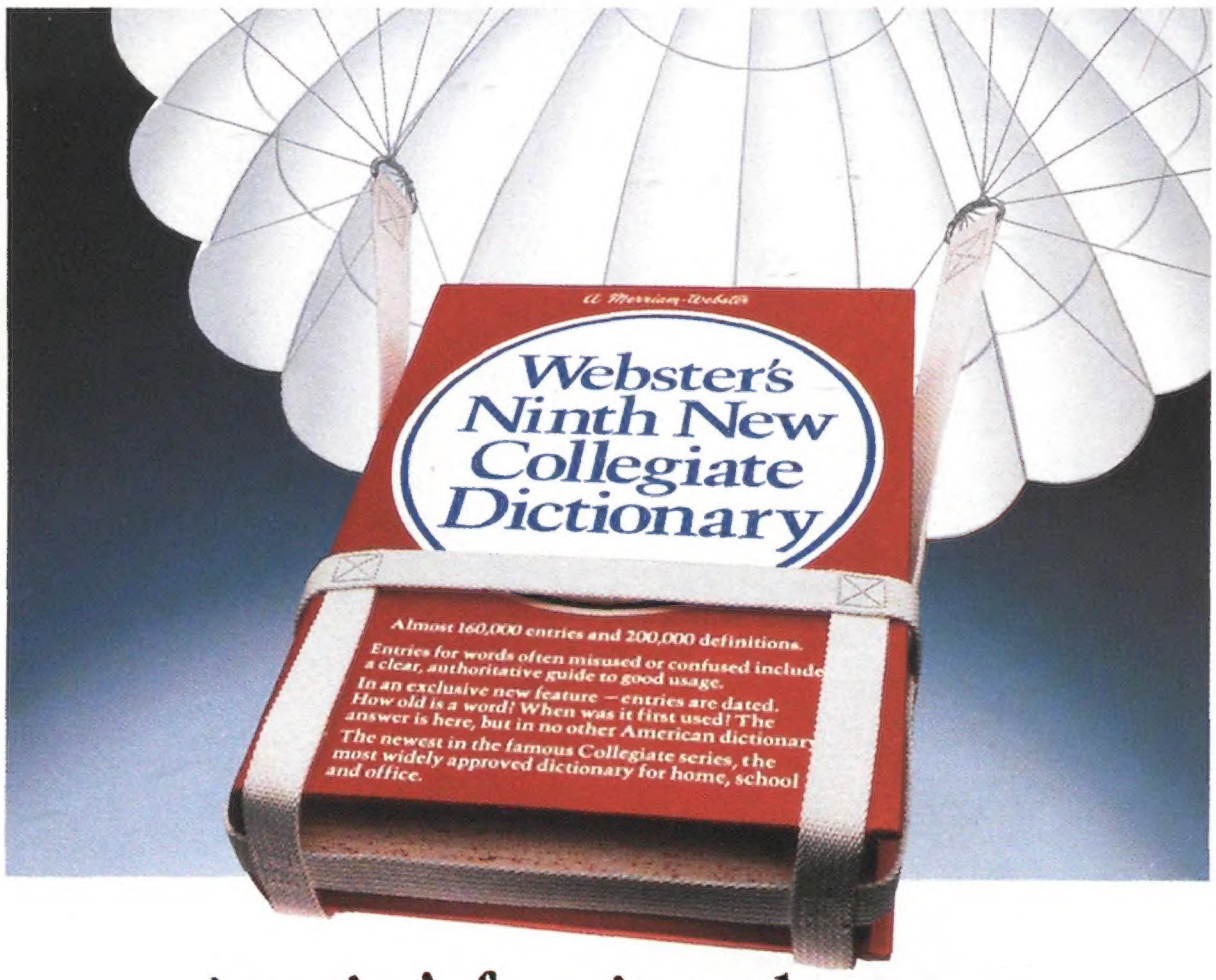
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Smithsonian horizons

A Smithsonian artifact for 39 years, the Enola Gay *is still a long way from being put on permanent exhibition*

The significance of most human arti facts found in museums lies safely in the past. Even when they are the enduring symbols of primordial hopes or loyalties, their more entangling meanings are put at a distance from visitors by railings or neutral display cases. Whether by design or not, viewers tend to be channeled toward moods of introspective contemplation and away from any stirring of strong emotions. There are, however, certain classes of objects that erase the possibilities of detachment. Icons of the atomic age are one of these.

As Alfred Kazin wrote in the *New York Times Book Review* on May 1: "The atomic bomb was called 'Little Boy' and the B-29 the *Enola Gay* after the pilot's mother. The bomb was inscribed with autographs and derisive messages to the Emperor of Japan, some of them obscene. But for all the fun and games, the fearful power, terror, hopes and delusions released by Little Boy changed everyone, forever. . . . Forty-three years later we are still struggling . . . with every effect and implication of that change. For war, the state, for science and art; for language, for individual and mass psychology; for human destiny in the smallest particulars of health and well-being, to say nothing of human destiny as a whole in dependence on the very survival of the Earth."

The *Enola Gay*, though never exhibited, has been an artifact in Smithsonian collections for 39 years. In operable condition when it was accessioned, it subsequently had to be moved. Years of exposure then followed before it could be disassembled and placed under cover. Even now, with a National Air and Space Museum (NASM) that for a dozen years has been the most massively visited museum in the world, the outlook for the *Enola Gay*'s early exhibit (at least in fully reconstructed form) is still clouded. It is understandable, in light of this record, that some have asked whether the Smithsonian once made a private decision never to place the aircraft on public exhibit. If not, how did things go so wrong?

The answer to the first question is that we are in the business of confronting and learning from history, not suppressing it. It *will* be exhibited. Neither in the surviving records nor in the memories of staff members of those years is there any hint of ambivalence on that score. There is none now.

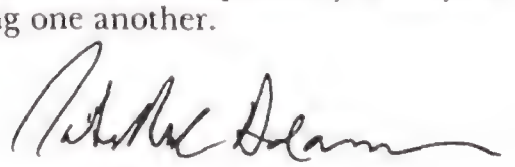
The answer to the second question is less clear. The National Air Museum, in effect the parent of NASM, had a minuscule staff and an equally small budget. Forced out of its storage facilities at what is now Chicago's O'Hare International Airport by the Korean War, it was apparently overwhelmed by the task of moving its collections to Andrews Air Force Base, which is located just outside Washington, D.C.

Now undergoing painstaking reconstruction in our specialized facility at Silver Hill, Maryland, the *Enola Gay* has been seen by visitors in small, prearranged groups. And while NASM was planned to contain a gallery big enough to house it when the museum was authorized in 1964, a substantially smaller structure had to be built when funding was finally approved in 1971. A B-29 is a big (141-foot wingspan) airplane. Short of some desperate remedy like removing a lot of other historic aircraft and crowding it in diagonally, we must await a major extension of NASM (not on the Mall, but rather adjoining a regional airport like Dulles) in order to be able to exhibit it.

We must live with these practical details, seeking more imaginative, quicker, perhaps only partial solutions. But as we do so, the wider ramifications of exhibiting the *Enola Gay* echo around us. For the men of the 509th Composite Group, 20th Air Force, who flew her or escorted her, the window of visibility was narrow and clouded. Behind lay knowledge of the Bataan death march and other Japanese war atrocities. Immediately in prospect was an invasion, immensely costly in lives. Save for Col. Paul W. Tibbets, the plane's pilot, they knew little of their bombload until the last moments. Even he, along with all American experts, expected merely an immensely powerful blast. But for us, 43 years later, the view can never again be so circumscribed.

An indissoluble part of an exhibit of the *Enola Gay* should be some account of what happened at Hiroshima—then and afterward. Probably the somewhat doubtful overall effectiveness of earlier and subsequent non-nuclear bombing—in Germany during World War II, and in Vietnam—also should be looked at, to provide a comparative perspective.

In taking advantage of a rare moment of absolute technical superiority to bring to an end one war, the coupling of the *Enola Gay* with Hiroshima placed before us the limitless horrors of another in which the grossly destructive powers would be more evenly divided. Beyond this, it must cause us to reflect on how much of the extraordinary human achievement of ascending so far, and so abruptly, from the Earth has been funded and energized by the general scramble for superiority in ways of killing one another.



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Letters to the Editor

Gemini 10

Dear Sir: Regarding your May article: as promotion director of *Playboy* magazine in July 1966, I received a phone call from a man at Cape Kennedy who assured me he would be the last one to stow the astronauts' gear into the capsule. His request: 4-by-5-inch photographs of two Playmate centerfolds, mounted on cardboard, to fit into the portholes of the capsule. Young and Collins would discover them when they opened the kit on orders from Mission Control to catch some sleep.

Twenty-two years later, I am happy that Michael Collins has gone public with this footnote to space history. The two ladies were Playmates Jo Collins (no relation) and Donna Michelle. And I can attest that they were not wearing bikinis, as depicted by your illustrator!

I like to think of Jo and Donna as America's "first women in space."

Nelson Futch
Boca Raton, Florida

Arlington Cemetery

Dear Sir: Mr. Barnard did not do justice to the section reserved for nurses who have served with our armed forces. Hundreds are buried there, including my mother, Dolly Belle Schmitt Proctor, a World War I nurse. Her funeral was held with full military honors.

Betty Gray Proctor
Statesboro, Georgia

Dear Sir: Your article left the impression that Ignace Jan Paderewski, virtuoso pianist and President of the National Council of the Polish Government-in-Exile during World War II, was buried in the cemetery. When he died at age 80 on June 29, 1941, Poland was under Nazi and Soviet occupation. President Franklin Roosevelt allowed Paderewski's body to be placed in a holding tomb at the U.S.S. *Maine* Memorial in Arlington, "until Poland is free."

His lead-sealed casket sits inside a cedarwood box mounted on wheels for that long-awaited trip to Poland and burial among the heroes of the Polish nation in Wawel Cathedral in Kraków, where he wished to be interred.

The Polish governments since 1945 have never requested the return of the remains because of Paderewski's association with the Polish Republic, created after World War I.

Frank Baranowski jr.
Detroit

Dear Sir: During World War II, I lived at the Henderson Hall barracks for Marine Corps Women, adjacent to Arlington National Cemetery. Any night of the week the low stone wall was lined by romantic couples prolonging the evening to the last moment, before the girls' mad dash through the gate. On occasion, a convention of feminine ghosts might be seen flitting about in all stages of deshabille in response to a midnight fire drill, with the dimly gleaming monuments as a backdrop.

Rachel Hermann
Chautauqua, New York

Dear Sir: As a 16-year-old summer grass-cutter during the Great Depression, I joined adult workers at Arlington Cemetery five days a week, to operate gas-powered lawn mowers up and down the rows of headstones. We were required to suspend our noisy operations during military funerals. I confess to watching the processions with awe, sadness—and relief at the respite from working in the summer heat.

Daniel H. Neviaser
Madison, Wisconsin

Dear Sir: Where did the name "Arlington" come from? Was it the name of the original mansion or was it named for some person of note?

John Allan McKaig
Big River, California

The Custis family used Arlington as the name for their first home on Virginia's Eastern Shore. Our national cemetery and the city surrounding it took their name from Arlington House (SMITHSONIAN, October 1985), *George Washington Parke Custis' mansion, which stands on the hill above the burial ground (below). Custis was the grandson of Martha Custis Washington and the namesake of the father of our country.* Ed.

Trade school

Dear Sir: Hans C. J. Gram (1853-1938) was a Danish physician who devised a stain that microbiologists still use to identify bacteria.

Sylvester Graham (1794-1851) was an American temperance advocate best known for his promotion of the use of a coarsely ground, unsifted flour, as in the type of cracker that bears his name.

Surely the type of staining that the students at Scarlet Oaks School use is Gram-staining.

James F. Hall
Roselle, Illinois

Dear Sir: It is not the cultures that are Gram-stained, but discrete colonies from the solid media cultures.

Barbara J. Snodie
Waukegan, Illinois

Building doctors

Dear Sir: Five years ago I watched the erection of a modern 50-story building in Hong Kong. Particularly interesting was the scaffolding, made entirely of bamboo. The framing was approximately six inches thick, held together at all joints by a wrapping of rattan soaked in water. When dry, the rattan gave great strength to the joints.

Thomas H. Henning
Chicago Heights

A
Grand View,
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Dear Sir: The circular, rotating device around which a moving cable is guided is called a sheave, pronounced "shiv." I doubt that the sheaves (also called pulleys) located near the top of the shaft are really "giant," but they are large. And they are not called "sprockets"—toothed wheels loosely similar to gears, functioning somewhat like sheaves but used solely to carry roller chain.
Glen E. Owens
Marlborough, Massachusetts

Dear Sir: What your story fails to mention is the appalling disregard of standards. The phenomena of fracture failure, metal fatigue and the other parametric construction information have been known for years, and a host of nonprofit, highly respected organizations have been developing construction standards for as long as a century.

The spate of catastrophic failures cited should come as no surprise. Why are there so many failures? Because a generation of engineers and architects has grown up without adequate training in the application of standards.

The crisis is so severe, the American Society of Engineering Educators will hold a conference in July to discuss how to educate the profession about standards before more lethal accidents occur.
Albert L. Batik
Parker, Colorado

Skin deep

Dear Sir: On page 164 the enlarged skin section "typical of the palm of the hand" contains six hair follicles. Hair does not grow in the palm of your hand.
Phillip L. Knotts
Zionsville, Indiana

Book reviews

Dear Sir: Penn State may have a great football team, but Dr. Albert Barnes was a graduate of the University of Pennsylvania Medical School in Philadelphia.
Lewis Stern Weiss
Rydal, Pennsylvania

The cloth of sloth

Dear Sir: I read Barbara Holland's delightful essay while in my bathrobe and felt, if not virtuous, at least blameless. I wonder whether she considers people who call their bathrobes "dressing gowns" part of her—our—enlightened group. What about "housecoat" people? My feeling is that they are not eligible; they don't understand the true down-home dowdiness of a bathrobe or have the character it takes to wear it proudly. I suspect that they never leave the house without a freshly ironed linen hankie as opposed to a wad of Kleenex and, moreover, that they spend more on sneakers than on books.
Barbara Cady
Brunswick, Maine

Dear Sir: Barbara Holland's article reminded me of a comment made by Lady Bird Johnson in her *A White House Diary*. Stopping by LBJ's room after a swim and finding it "full of men," she retreated hastily and wrote of the experience that it was an inducement to "always have your hair combed and give that old comfortable bathrobe to the Goodwill charity organization."
Lois Wilson
Berrien Springs, Michigan

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Around the Mall and beyond

Right now, Discovery Theater is dark. That's one of those odd expressions that form the argot of acting, like "greenroom," and studying your "sides," and "break a leg." Being "dark" simply means the lights are out on the marquee. The 1987-88 season has ended at this glowingly successful children's theater over on the western side of the Arts and Industries Building.

Discovery Theater, however, is a long way from being silent and inactive. It has just finished its tenth season as a Smithsonian feature, and Director Susan Swarthout and her small staff are, quite literally, getting their acts together for a new decade, which will start in October.

Susan's office is just inside the garden entrance to the Arts and Industries Building, not more than 30 steps away from her theater. She's an actress and director, a dark-haired, restless woman who, when I visited her, seemed unused to sitting at a desk. Courteously, she put aside important things in order to talk, but I knew that if, 30 paces away, a set sagged, an amplifier squealed, a light bulb flared out or a performer called in with laryngitis, she'd be gone like a patch of morning mist.

At the time she joined the Smithsonian, five years ago, Susan Lee Swarthout had been touring schools in the Washington area as part of a children's theater company. Fun? Interesting? Yes, indeed. But, "at 7:30 every morning I had to load the company's van and do the rounds of the schools. One cold February morning, after carrying my stuff up three flights of stairs, I said to myself, 'I don't want to do this anymore.' After that I got this job, and I like it."

The Smithsonian had been putting on puppet shows for children since 1968. The theater started as a tent on the Mall, then moved to a space in the Museum of American History. "After that," said Susan, "they took over a storage area here. In 1978, ten years ago, the space was renovated and turned into a theater as part of the Smithsonian's Division of Performing Arts. The first performance there that December was a puppet show. Five years ago the theater became part of the Smithsonian's Resident Associate Program."

Susan was glad to get up from the desk and show me the theater. We walked out into the west bay of the museum, toward the sign that hangs over a passageway: "Smithsonian Discovery Theater" painted in the discreet style of 1876—the motif of this building. "We have to keep that sign, of course," said Susan, "but it's so genteel that no one could find us at first. Even last week, I overheard a woman say to her husband, 'Ooh, look! A nice old 1876 theater!'"

Why people on Avery Island, Louisiana, don't think twice about inviting their friends for leftovers.

To most people, eating leftover food is a little like hearing yesterday's news again; it's definitely a lot less interesting the second time around. So why is it that the good folks of Avery Island feel so differently?

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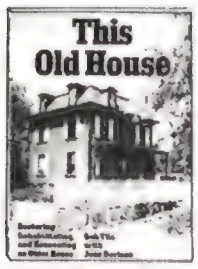

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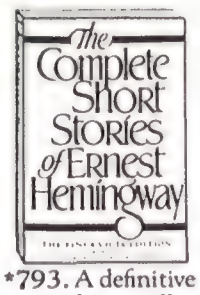

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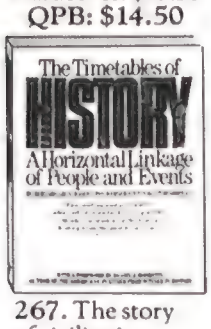

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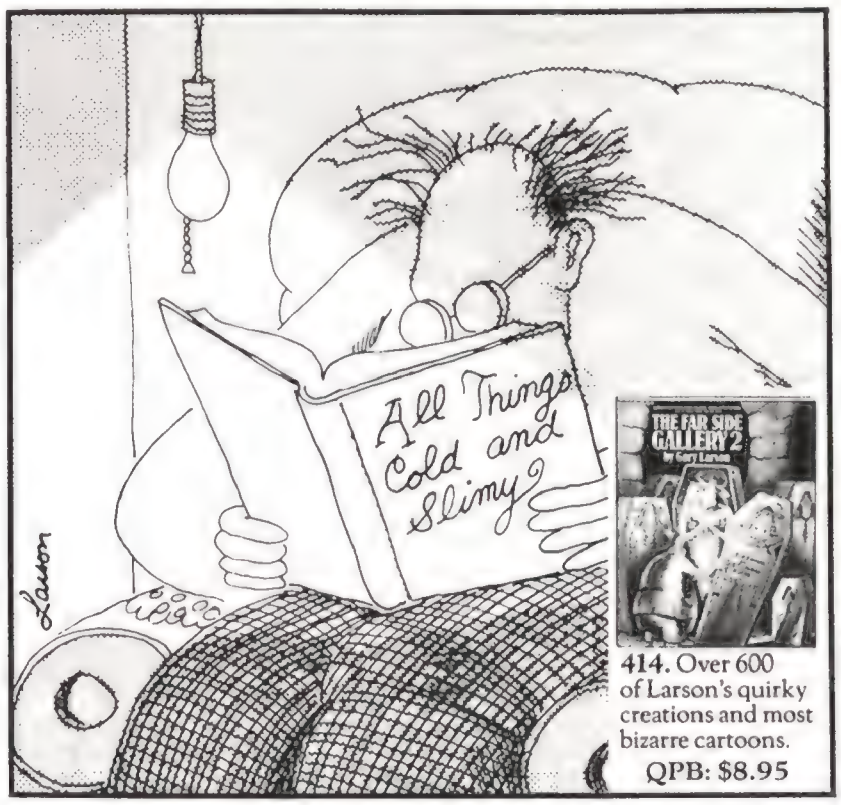

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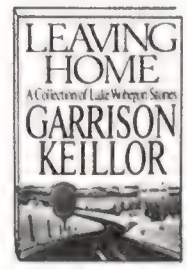

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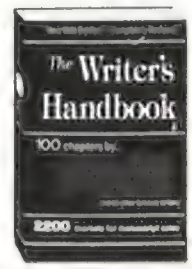

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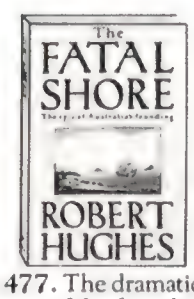

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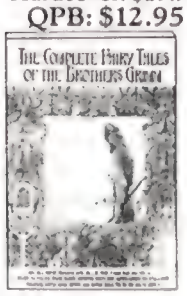

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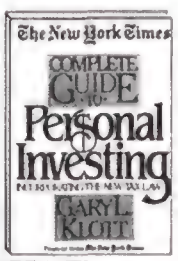

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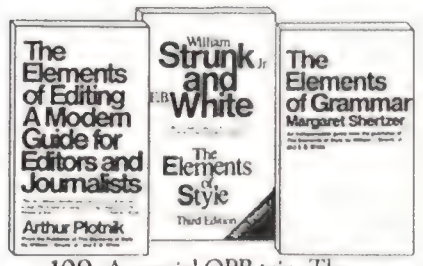

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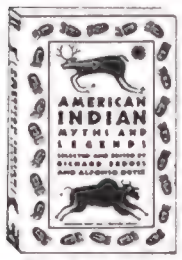

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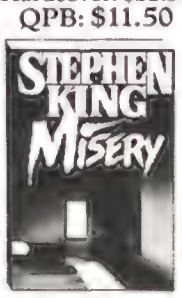

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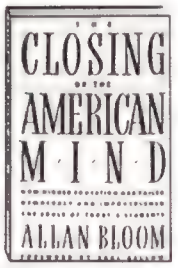

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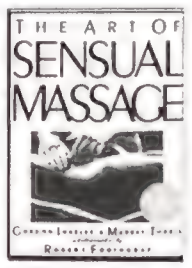

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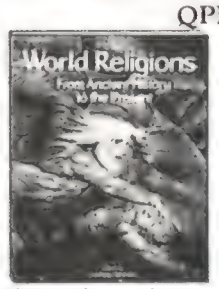

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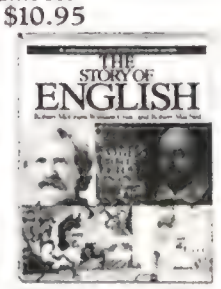

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Both children and parents are caught by the magic of Discovery Theater's *The Queen Who Wouldn't Bake Gingerbread.*

Nice it is, certainly, but also very modern, with giant carpeted steps where the audience sits. Perfect for children too young to worry about back problems.

"This is one of the few functional theaters I know of that's designed especially for children," Susan told me. "We get school groups from Washington and 11 surrounding counties. They come from as far away as—I think this is right—Winchester, Virginia."

And the ages? "We've always had preschool children, maybe 3 years old. They go up from there."

Looking at the tenth season's program, I found a broad and interesting mix of offerings, with recommended ages tacked on. *Too Much Nose,* for example, adapted from an Italian folk story, is full of audience participation and was considered OK for prekindergarten up to third grade. So was *The Queen Who Wouldn't Bake Gingerbread,* a one-woman show that also depends heavily on the audience for help.

Beauty and the Beast may have been a hot adult item on TV for the 1987-88 season, but here it was a puppet show recommended for kindergarten to fourth grade. And the Kankouran West African Dance Company was for fourth to eighth grades.

The youngest children seem to come from day-care centers. "We've had them as young as 2," says Susan, "which we really don't recommend. I remember, for instance, the case of the dinosaurs."

Dinosaurs, she explained, noting my bewilderment, are almost 100 percent popular with kids. So a dinosaur show was proudly scheduled to open the 1984 season. A puppeteer came along with enormous hand-puppet dinosaurs that, according to the script, would come to life when dusted.

"The audience came from a day-care center," Susan remembers. "*Real* little ones, 2-year-olds, even. They were packed in, up close to the stage. And when these humongous dinosaurs came to life, the kids simply *levitated*! They backed all the way to the wall on their bottoms, mouths open, eyes huge. Yes, it was funny, but it was awful. We're not here to frighten children."

The actress playing the curator who did the dusting instantly ad-libbed some nice soothing lines to bring the kids back to earth, and the puppeteer, out of sight, caught on that something was wrong, and she ad-libbed, too.

Puppets are still reliable fare for children. "But," Susan said, "after starting there, we soon eased into life-size shows as well, in order to broaden our field."

The group does eight to ten shows a season—about one a month from October through June. The off-season—when they're dark—is the time to prepare, to promote. "We give teachers educational materials about the program," Susan told me. "Each show is explained in a 15- to 25-page booklet. And we work on the one original show that we do every year."

She explained that most of the performances are picked up from other sources, just as they are in a repertory theater, but that Discovery Theater puts together one show, specially written for it, each season. These homegrown shows open the door to some innovative ideas and approaches. For example, next season's original, dealing with Rosa Parks' civil rights adventures, will be interpreted for deaf viewers.

"But," said Susan, "instead of somebody standing off to the side of the stage, following the dialogue in sign language, we want to try a shadow interpreter—a signer who acts as the speaker's shadow. This approach allows deaf viewers to get the dialogue without missing the action."

As a director herself, Susan is excited by the possibilities of this technique. "Does the 'shadow' take on his or her own personality? An alter ego of the speaker? Fascinating!"

Swarthout would like to direct this herself, but feels she's too busy. She recruits directors from the Washington metropolitan area because she is very much a part of the local theatrical community and feels loyalty to it. She has her stable of directors and is gradually increasing its size. After ten years, Discovery Theater is considered a plum for a contract player or director.

It was time to leave the theater to its next audience. I had been aware of a high-pitched background sound that had been building up in the corridor outside, like an enormous flight of wild birds coming closer, filling the sky, yelling their little heads off.

Hastily, I took a last turn around the stage, glancing at the simple, rather cramped wings, the familiar clutter behind the backdrop. I met Arthur, the technical director, who pointed out an old vaudeville sign, left over from a performance presented by the Division of Performing Arts, hanging backstage where the audience can't see it:

"This Theater Caters to Ladies and Gentlemen and *Children.* Vulgarity will not be Tolerated. Don't use words: Hell, Damn, Cockroach, Spit."

Then the floodgates opened and the noise poured through in full freshet: the excited voices of children waiting to enter Discovery Theater. Surely there must be thousands of them, I thought. But when they filed to their places, they proved to be a manageable number, and the sound suddenly hushed. Quiet and mannerly, they waited for the magic.

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Phenomena, comment and notes

In the Florida Keys a great blue boldly stalks where no heron has gone before.

If you don't have to get into the wild to see wildlife anymore, can it mean that the wild is not what it used to be?

My friend laughs a little when I head out the door to get back to nature. She has not been the same since I took her to see one of the 200 saltwater crocodiles still hanging on in Florida. A local expert on Key Largo had agreed to take us; I assumed we were headed for the new national wildlife refuge established especially for these endangered throwbacks. Instead, after winding around back roads, we arrived at a run-down marina. Our guide looked crestfallen. "Usually there's one sunning itself on the boat-launching ramp," she said.

My smiling friend knows that my idea of getting back to nature has little to do with what John Muir used to do. The places I go have trails well marked with both signs and beer cans. Boardwalks appear where the ground is damp. A nature center on the grounds has proper restrooms. I feel a little silly myself. We are both victims of an ideal: that wildlife should be seen in their own Edens, places where humans have had no impact. An unnamed lake in the Canadian north, perhaps, or a little-known valley in the Andes.

The wild creatures themselves are not so fastidious. More of them than we might expect have learned to live with us. I do not mean the rats, roaches and sparrows that live with us everywhere or even the spiders, mites, whiteflies and aphids that find homes on our houseplants. I mean those wild creatures we associate with wild places—like the Mississippi kites that Jim Parker writes about in this issue.

A case in point. In my part of Washington old trees line the streets; each house boasts a postage-stamp yard in front and a slightly larger yard in back. Lots of us feed the birds through the winter. Early last spring I noticed something alarming. In the morning, when I walked the dog around the block, the noise was phenomenal. Birds were seeking mates and staking out territories so vociferously that I began to wonder about ear protectors. Some days I would take the dog six blocks down the hill to where an abandoned mansion abuts a park. This was real habitat: some towering old trees, lots of new growth and understory, overgrown fields, a robust little stream. The dog and I would slip through the iron fence and walk down to the stream . . . in perfect silence. Not a note to be heard, not a bird to be seen. Every last one was up among the houses, the people, the cars gunning to make the light.

Curious. As spring softened the world, I heard of mother ducks leading their new broods across six-lane boulevards downtown, making their way from little artificial ponds in front of government buildings to the muddy embrace of the Potomac. Beavers invaded backyards in the Virginia suburbs, dropping prize-specimen trees on manicured grass. Interesting. Only when I sneaked in a little birding on a couple of business trips did a pattern suggest itself.

In Florida I rushed from Miami down Route 1 toward the Keys, scanning the telephone wires and ditches along the road as I drove through a remnant of the Everglades. White wings through the reeds caught my eye at one point, and I stopped to check out the egrets feeding in a ditch. There, in all

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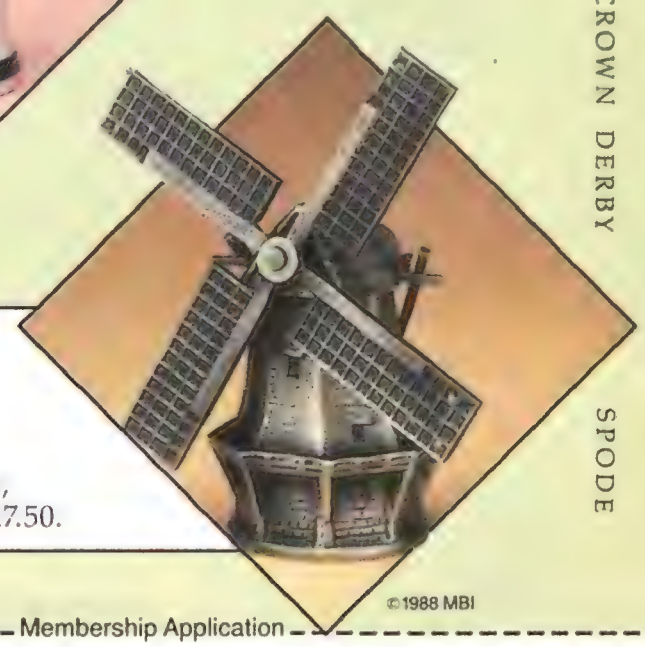

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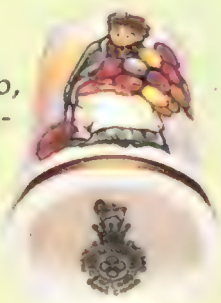

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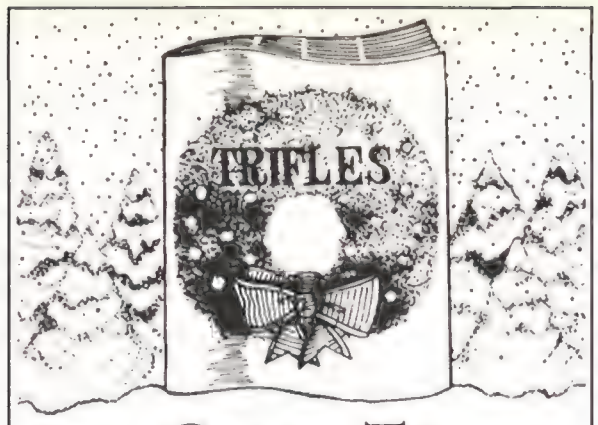

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SWAN HELLENIC

its pink splendor, was a roseate spoonbill, huge next to the egrets, swinging its spatulate bill from side to side in the muddy water. I was not to see another in all the protected parks and refuges from there to Big Pine Key.

Another day I went north, to the Loxahatchee refuge. I dutifully walked the dikes around the impoundments, happily watching the ducks and black-necked stilts. Back at the headquarters, next to the bustle of the parking lot, I looked up to see large white birds with naked heads in the tops of the trees: wood storks, an endangered species. Eleven of them perched there, while another three flew in circles.

Then there was a weeklong meeting in San Diego, in a hotel on filled wetlands in Mission Bay. The hotel had gone to extraordinary horticultural lengths, planting tropical trees from around the world. In the middle was an elaborate pool in which the water was a porcelain blue, the result of a dye used to discourage algae. It looked totally artificial, and in my wisdom I decided to have nothing to do with the ducks and coots that would paddle frantically toward anyone who paused by the 25-cent feed-pellet dispenser. My moral superiority meant that for two days I failed to notice the herd of black-crowned night herons that spent their days on an island in the pool. Finally I looked, and saw also a couple of dozen lesser scaup (a sea duck), the wildly painted eye of an American widgeon, a wood duck couple just coming into their nuptial splendor, a scattering of Mexican black ducks and a double-crested cormorant that appeared to be fishing successfully in that strange blue water.

One free afternoon I rented a car and headed south. I tried the Tijuana River National Estuarine Sanctuary, where the river comes out of Mexico to empty into the Pacific. The river itself gives you the impression that you would not want to swim in it. Worse, you cannot hear yourself. Abutting the refuge is a naval air station where helicopter pilots train: all day long the huge machines beat out over the beach and back. A horrible place to go birding . . . except for the birds. The muddy banks of the tidal channels were loaded with willets, whimbrels, godwits, and a still more exotic bird I had never seen before: the long-billed curlew, the bearer of a down-curving bill eight to ten inches long.

By then it was dark and windy, but I rushed to one more place, the southern end of San Diego Bay. Shivering, I headed out onto the dikes around a salt-evaporation plant. The pickings were poor: dark ducks at a distance, an occasional cormorant diving. I turned with the dike and found myself headed for shore at the very bottom of the bay, walking above some sort of drainage channel. The tide had run out, exposing dark mud and the usual trash. And then, there just ahead of me, delicately foraging, were half a dozen birds of a species I had been hoping for years to see: the American avocet, a good-size wader with a long bill that curves up near the end, the head and body a striking black-and-white pattern with the pinkish tan of breeding plumage taking shape. In an ugly place, a beautiful creature carried on as it had for thousands of years before humans assaulted its home.

Late on the last afternoon, I wandered over to the marina in the next cove. Out in the channel floated a long row of bait boxes, their tops just above the water. And standing shoulder-to-shoulder along the entire row was the largest collection of great blue herons, great egrets and snowy egrets I have ever seen. In front of me the crew was cleaning up a charter fishing boat. A brown pelican waited in the water for scraps. But the crew kept pushing the pelican away with a broom: they were feeding the scraps to a sea lion. It reminded me of the Keys, where normally shy great blue herons invade backyards and motel grounds looking for handouts.

Life pushes against the boundaries in every direction, including straight into the strongholds of civilization. Birders drive out of cities to find the unusual, the spectacular, the rare. But the birds themselves push into cities, looking for Lebensraum. Loren Eiseley once wrote of birds perched on a television antenna, asking each other: "Are they gone yet?"

The question that comes to mind is whether we have so impoverished the natural world that more and more wild creatures are learning that they must approach humans to find what they need. (Those panhandling herons in Florida raise young more successfully than their counterparts in the wild.) Perhaps our cities are becoming to wildlife in general what the Yellowstone garbage dumps became for bears. Whatever is happening, it behooves us city dwellers to keep our eyes open.

John P. Wiley jr.

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Polovetsian Dances from Prince Igor is new to the company's repertory. Tribal warriors from the steppes explode with energy, whirling and leaping about, rehearsing to the music of Alexander Borodin's opera.

By Ralph Backlund

From a garage on West 152d Street, a ballet company soars to Moscow

"Mr. M" leads Alan Barnes and Augustus Van Heerden in pose that dancers assume while waiting to perform.

Arthur Mitchell wanted to help minority kids; now his Dance Theatre of Harlem is cultural ambassador to three continents

Dance studios are all alike: a bare room, with or without windows; railings projecting from the walls on three sides (the barre); and a mirror covering the fourth wall.

Dancers, too, are all alike: they arrive at the studio with satchels holding a pair of ballet slippers or toe shoes, a towel, sweaters, a can of Coke. They are dressed for work—in leotards, tights, leg warmers, cut-off sweatpants, T-shirts or, on some of the women,

Photographs by Jonathan Atkin

flimsy tie-on skirts sewn of drab, nondescript chiffon.

But what makes this studio and these dancers different is that they are both far up in Harlem, on West 152d Street. This is the home of the Dance Theatre of Harlem (DTH). At the moment they are rehearsing *Fall River Legend,* Agnes de Mille's ballet about Lizzie Borden and her ax, which the company took with them to the Soviet Union in May and June. Lorraine Graves, the ballet mistress, sits in a folding chair with her back to the mirror. She is conducting the rehearsal, smoothly, efficiently, making suggestions without raising her voice.

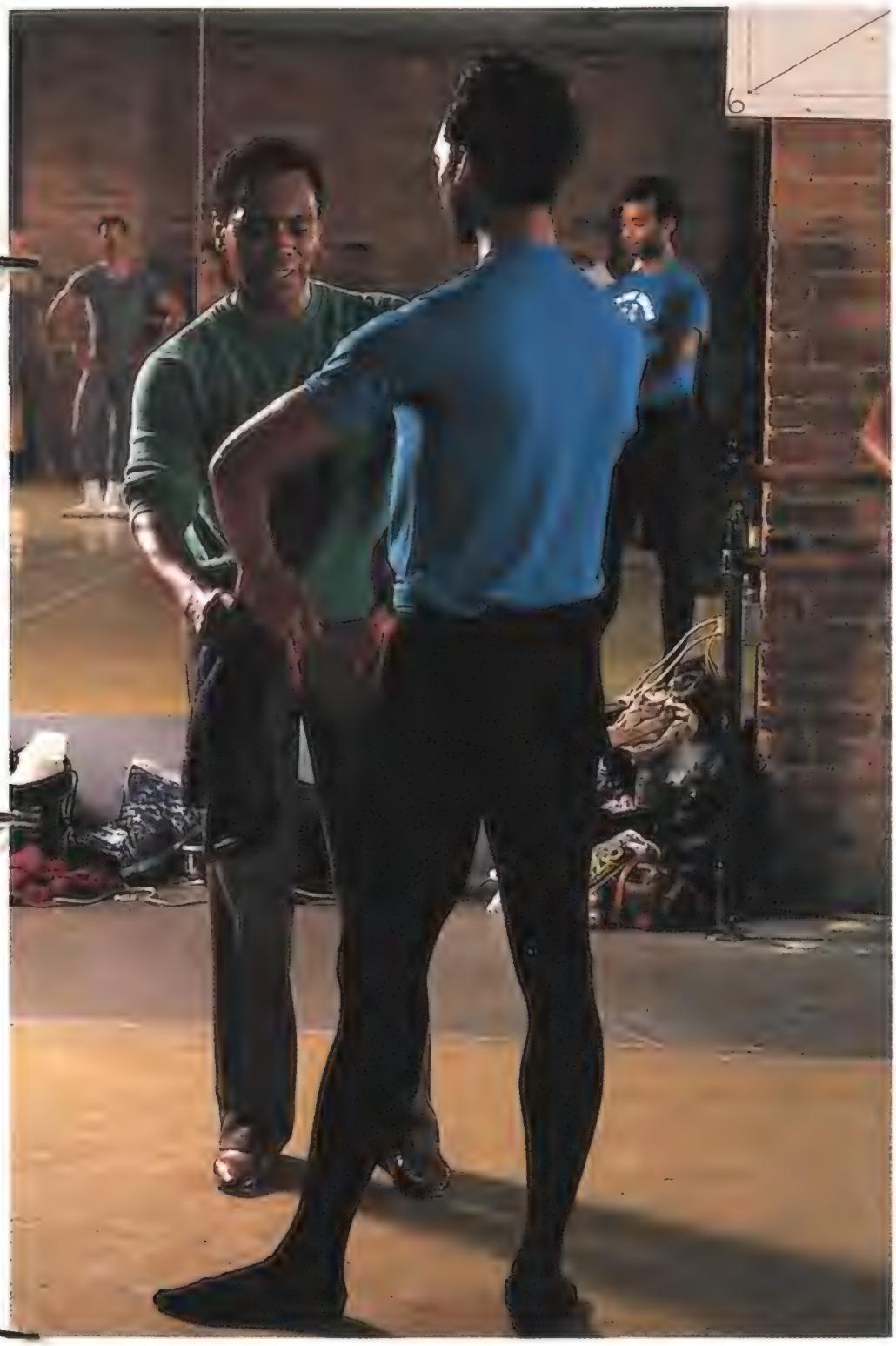
Then Arthur Mitchell walks in. *Mr.* Mitchell. Dance companies are formal and have good manners. Nobody calls him Arthur; "Art" would be unspeakable. A vigorous, young-looking 54-year-old, Mitchell is the founder and artistic director of the company. He is wearing a double-breasted blue blazer, gray slacks, handsome shirt and tie. Perhaps he has come from an appointment downtown, but in any case his sartorial splendor could not be in greater contrast to the disheveled getups of his dancers.

Miss Graves rises from the chair and drops to the floor beside it. Mitchell takes her place—and takes over. He galvanizes the company, shouting from his chair, jumping up to demonstrate the way a step should be done, always emphasizing the special flavor of *Fall River Legend.* "You're being too *dancer,*" he tells one. "Nobody does that but dancers." To another: "When you are bitter inside, it should manifest itself in your body. Don't stand so *beau*tifully." To the company at large: "If you see one person's eyes go like this"—he glances to the side—"it breaks the whole concentration." Inner concentration is something you have to work at; in his words, "it makes the difference between the ballerina and the corps de ballet." And finally a word about the emotional climate of Lizzie Borden's story: "The farther north you go, the tighter people become. This is New England. The weather tells you what to do. It's that kind of stuff." Then he is off to another appointment.

An electrifying Agon, *a mischievous Puck*

Mitchell was for more than 13 years a principal dancer with the peerless New York City Ballet (NYCB), its first and—until recently—only black dancer. It all began when Mitchell, in his late teens, faked some steps for an audition and was accepted by New York's High School of Performing Arts. On graduation, he won the school's annual dance award and was offered scholarships to Bennington College and the School of American Ballet (founded by Lincoln Kirstein and George Balanchine). He chose the latter and in 1955 was invited to join its parent company, the NYCB. He

Demonstrating, admonishing, placing, participating, Mitchell leaves nothing to chance. In Harlem studio (above), he shows dancers the proper carriage in a la seconde, one of the five arm positions. Top right, he calls out a correction while company members in background practice and observe. Then he explains to James Goree why a certain arm position is incorrect and, finally, joins the women in a croisé derrière with arms in arabesque: with their bodies at an oblique angle to the audience, dancers cross one leg behind them, while extending their arms fore and aft in a long, graceful line.



danced in virtually all the ballets in the repertoire but is most vividly remembered for the electrifying pas de deux in *Agon* and for his mischievous Puck in *A Midsummer Night's Dream.* These roles were created especially for him by Balanchine—Mr. B—and no one else has left such an imprint on them. In 1968 he left the company. He was approaching 35—when many dancers can look over the hill to the downgrade—and was ready to put his considerable organizational abilities to work.

The government, through the USIA's cultural exchange program, asked him to go to Brazil for eight weeks to help set up a national ballet company. This was so successful that the Brazilians asked him to come back. He was ready to leave again in the spring of 1968, when Dr. Martin Luther King jr. was assassinated. That put things in a different perspective for him. "I saw there were so many problems here," he says, "that I thought I ought to be doing something for minority kids in America rather than going to Brazil. I said, 'Mitchell, Arthur, put your money where your mouth is. Do something.' "

Dorothy Maynor, a distinguished black soprano who had retired from the concert stage, asked him to start a dance program at her Harlem School of the Arts. "She had a garage as part of the property," he says. "So I took my own money and built a wooden floor—a 'sprung' floor for the dancers—and put up barres around this garage. I started with 30 children and two dancers. I charged 50 cents a week. The whole point was not that I wanted to make dancers of all these kids, but that I wanted to get a sense of structure and discipline in their lives. It would make them better human beings. They would sit better, talk better and dress better. And that discipline would carry over into their schoolwork.

"Everybody thought I was absolutely insane. They said it would never work. A ballet school in Harlem? Minority kids, black kids, a European art form, classical dance? 'Mitchell has really flipped out this time.' Inside of two months I had 400 kids, inside of four, 800. It was so hot in this garage, because it had a tin roof, that we had to leave the doors open. The street gangs and the kids walking by would see us at work, and I'd say 'Come in.' Naa-ah. So I'd relate what we were doing to basketball and football. I'd tell them that if you have a good demi-plié, which is a bending of the knees, and more power in the ball of your foot, you can jump higher: 'I can take someone who's five-foot-ten and teach him to jump higher than someone who's six-foot-two.'

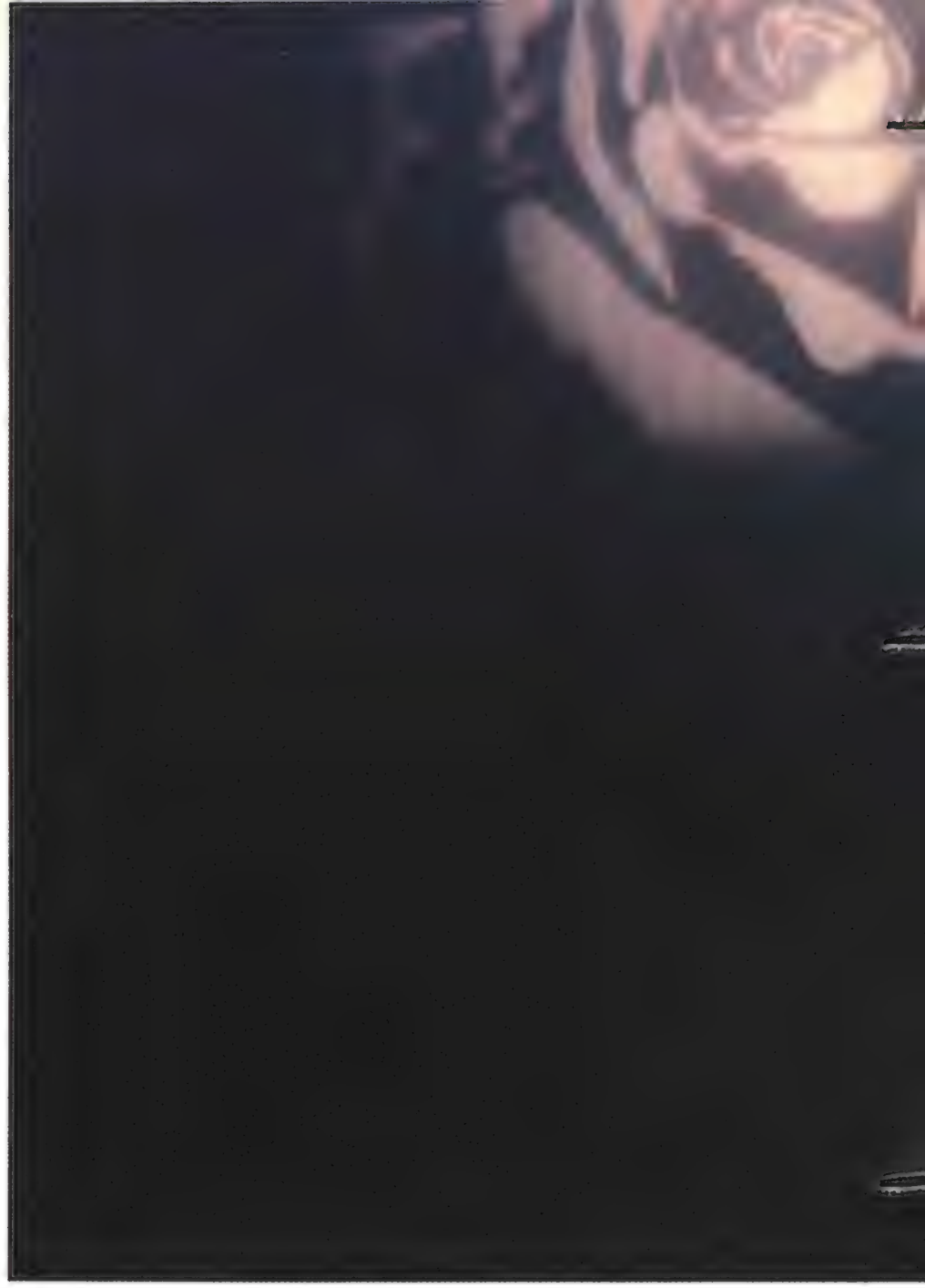
"This intrigued some of the boys. And when I said,

SMITHSONIAN's former executive editor, the author is now one of the magazine's contributing editors.

Fall River Legend's Virginia Johnson plays murderess, is scolded by spirit of her mother, Lorraine Graves.

Donald Williams as Baron Samedi, powerful, sensual Voudoun deity of *Banda*, represents Eternal Figure.

Company apprentice Waverly Lucas adjusts headpiece for Geoffrey Holder's Hindu-African ballet *Dougla*.



Created for company by Louis Johnson, *Forces of Rhythm* fuses classic ballet, ethnic and modern dance.

'Come in and have a look,' they said, 'Well, if we do, we're not going to wear any of those things.' They meant leotards and tights. So I said they could wear cutoff dungarees or bathing trunks. That's how I got the boys enrolled. And I would teach them a ballet class to drums, because all boys like drums. I had them doing tendus and demi-pliés and ronds de jambe. But they didn't know they were doing ballet, so the stigma wasn't there."

Six months later, the dance component of Dorothy Maynor's school was larger than all the rest of it put together. There was no space for it. But Mitchell wanted to keep his classes going, to stay with the kids. So he went to Balanchine, who said, "OK, Arthur, start your own and I'll help you." What he started was the Dance Theatre of Harlem. (A cofounder was the late Karel Shook, a renowned teacher with whom he had studied: "a great ballet teacher," according to Mitchell, "who didn't have other white teachers' prejudices.") It was incorporated in February 1969 as a nonprofit organization. "I never initially intended to have a ballet

Gregory Jackson executes a pas de chat (cat leap) to strains of popular song about a rose in Spanish Harlem.

company," he says; "it was just to have a school to train youngsters and keep them off the street." He applied for a Ford Foundation grant, but one of the stipulations of the grant was that the funds had to be matched by earned income. Without a company, how could they earn income? "So I thought the only thing to do was to start one," he says. "We began by doing lecture-demonstrations for the community. That's how we earned some income and that's how our students began to think of themselves as performers."

They made their debut early in 1971 in Frank Lloyd Wright's Guggenheim Museum. When some well-wishers objected, "But there's no proscenium arch," Mitchell replied, "But Shakespeare didn't have one, either." They built a platform in the center of the rotunda and seated the spectators on the ground level or on the spiraling ramp. They bused in children for the lecture-demonstration. "It was killing two birds with one stone," says Mitchell, "because it was bringing in a public that would not normally come to the museum, and the museum was giving us space to perform in."

Christina Johnson, James Goree rehearse pas de deux they dance in George Balanchine's *Concerto Barocco.*

Dougla People are a meld of Hindu, African cultures, celebrated in dance by Carol Crawford, Gregory Jackson.

Stretching during a breather, Eddie J. Shellman focuses on Mr. M's demonstration of next combination.

Dance Theatre of Harlem

One of the Dougla People, Robert Garland has his costume fitted by wardrobe assistant Vernon Ross.

The company has long since graduated to real theaters and has performed in them on three continents. Its repertory ranges from a number of Balanchine ballets, including the 54-year-old *Serenade*, to more recent ones with a strong African flavor, Geoffrey Holder's *Dougla* and the first act of the Arthur Mitchell-Billy Wilson collaboration *Phoenix Rising*, a work in progress. Between these stylistic extremes are contemporary works such as Garth Fagan's *Footprints Dressed in Red*; reworked versions of familiar classics, like John Taras' sizzling *Firebird*; and new stagings of Eugene Loring's *Billy the Kid* and Fokine's *Polovetsian Dances from Prince Igor*. A special case is the company's Creole *Giselle*, choreographically faithful to its 19th-century namesake but set, instead of in Central Europe, in a colony of free blacks living in Louisiana during the same period. Millions saw it in a 90-minute telecast, hosted by Bill Cosby, on NBC in December 1987.

Along with the repertory, the company has developed its own distinctive style. At a press conference last December to announce the forthcoming Soviet tour, three members of the company danced John Butler's *Othello*. Among the dance notables who were present was the great ballerina Alexandra Danilova, who teaches at the School of American Ballet. She whispered to a neighbor: "Notice that he doesn't dress the girls in pink or white tights or toe shoes." Mitchell explains: "I choose to use flesh-tone tights and shoes rather than pink because they harmonize so much more realistically with the dancers' various skin tones." Just as distinctive, and unusual among dance troupes, is Mitchell's insistence that everyone in the company learn, theoretically, everyone else's job. It is not enough to be just a dancer; they learn, by doing, about lighting, sound, wardrobe, publicity, administration, developing budgets. They are also encouraged to take courses at the city's colleges and universities.

Proof that there is life after ballet

The idea is to make the company self-sufficient, as well as to provide jobs one can move on to after dancing days are over. Mitchell is very proud of his alumni. He mentions that an "Assistant District Attorney of the borough of Brooklyn was one of my dancers, Marcia Sells. She says she succeeded as a lawyer because she used all the discipline she learned in Dance Theatre. Susan Lovelle, one of our first ballerinas, is now in medical school at Columbia University, graduates this June and is on the dean's list." Others include Lydia Payne, an executive with the Wall Street firm of Dean Witter Reynolds; Steve Terry, now with Production Arts, Inc., a theatrical lighting company; Adrian Wells, a member of the wardrobe department at the Metropolitan Opera. And of course there are

Iris Cloud puts her Pre-professional class through extensions in second position. Most of these children have been with her since they were 9; some of her former students are now dancing with the company.

performers like Ben Harney, Ben Vereen and Hinton Battle, who have all won Tony Awards on Broadway.

Self-sufficiency has been a hallmark all along. Mitchell needed costumes for the company. He couldn't afford to hire Madame Karinska, whose elegant designs clothed the New York City Ballet, so he started a sewing and tailoring program. "We would teach youngsters how to sew, and I would hire them to make our costumes." He brought in Zelda Wynn, who was running sewing classes his nieces were enrolled in, to be head of the wardrobe department. "I went to the Singer Sewing Machine Company," he recalls, "and asked if they would donate machines. They said, 'We don't donate, but we'll lend some.' I still have them."

There was also the need for a base of operations. He inquired among the other companies and learned that they were all renting their space: "So I said, 'If we have to pay $50,000 a year, we might as well buy a building.' " He found on West 152d Street an unused garage (another garage!) and acquired it in 1971 with the help of the Bernard F. and Alva B. Gimbel Foundation. A $375,000 renovation created a large studio on the second floor and two smaller ones on the first, along with a wardrobe room and minimal office space. Every cubic foot is utilized (one office is in the former freight elevator used to move cars up and down). The company needs space of its own but shares what there is with the school. That they don't step on each other's toes, literally, is a measure of the goodwill and spirit of accommodation that informs the entire enterprise.

A first-time visitor is bewildered by the ceaseless activity. In one of the ground-floor studios, Nancy Schaffenburg, the director of the school, is conducting a class for advanced students. A pianist tinkles out some ballet music—overfamiliar, tacky even, but with a definite beat against which to move. Schaffenburg is an alumna of Radio City Music Hall, the Ballet Russe de Monte Carlo and the Metropolitan Opera Ballet, among others. She is gentle and encouraging, but makes her students work hard. "That was good," she will say, "but insecure—keep looking in the mirror." Then she dismisses the class and sends them next door to Istvan Rabovsky. The girls take off their toe shoes and slip into "character shoes"—with heels and a tie across the instep. Rabovsky, a former star of the Budapest State Ballet who fled to the West in 1953, works

In DTH's new *Billy the Kid,* Billy, who committed first murder at age 12, does arrogant, assertive dance.

with them on one of the ethnic dances that turn up in most 19th-century ballets—a mazurka or polonaise. It is all a far cry from, say, *Fall River Legend* or, for that matter, from Harlem. Rabovsky shouts, stamps, and gives a convincing display of what we think of as Hungarian temperament. He scolds the boys for landing too audibly. "Do I hear noise? Oh, the noise is killing me! You are landing with *thuds.*" Then he laughs and everyone relaxes.

There are classes every day. In the Pre-dance class, 3-year-olds are given simple movements—right, left, up, down, skipping, hopping, counting. Then, Pre-ballet—rudimentary ballet exercises, including work at the barre. And so on, from Dance I for beginning students through Dance III, a pre-professional program for young adults. Throughout, there is stress on behavior and discipline. "I don't know what you did to my daughter," one mother recently told Mitchell, "but she came home and said, 'I've got to comb my hair. I won't wear earrings to class any longer.' And, you know, her homework is getting better." Mitchell knows why. "It's because we are putting a sense of structure and discipline"—those words are his leitmotiv—"in their lives. When you see all the negative influences out on the street—the drugs, the lack of pride in themselves—something positive has to be given them, something they want to do."

What they want to do, in Mitchell's opinion, is dance. Dance is a form of athletics with structure and discipline carried to the nth degree. "America is a very physical country," he says, "and it's getting more so—jogging, aerobics, all that kinetic energy being used up. I think that's why dance has become so popular."

For strong legs and footwork—try ballet

Some of our top athletes are now studying dance, if with a bit of embarrassment. "I would say to a coach," he goes on, "'Can you imagine a football team with the precision and timing of a corps de ballet?' Whereas they work on the top part of the body, dance strengthens the legs and footwork." He mentions the 1984 Olympics. "Our gymnasts always had the heart, the guts, the technique, but they never had finesse. Then they started studying dance, and it made the difference. Take our skaters. Peggy Fleming wasn't the strongest technician, but her ballet dancing gave her that line. Swimmers, divers—Greg Louganis won two gold medals in '84. Where did he get that form, that purity of line? He studied ballet with Jillana, a former dancer with the New York City Ballet."

Mitchell's school has always been integrated, even though most of its students are black and come from Harlem (it also draws from a score of states other than New York and perhaps a dozen foreign countries). But in the beginning the dance company was all black. "When I started it," he says, "there was the feeling that blacks could not do classical ballet. Where this myth or fallacy came from or was perpetuated, I don't know. Everyone kept telling me I was the exception, but that's because Balanchine and Kirstein gave me an opportunity. So, rather than argue, the best thing to do was to provide the same opportunity for others and show that it could work." He proved his point, and now that black dancers—many of them alumni of DTH—are beginning to enter the other major companies, he is prepared to integrate his own.

The staff, too, is integrated. A prominent member is Ruby H. Herd—Dr. Herd to everyone—who was president of El Centro College in Dallas. She asked Mitchell to come down and help her set up a dance department. He did, and they have been friends ever since. When she retired, he asked her to come up, make an assessment of the organization and tell them what to do to make it better. "But I'm retired," she protested. "I want to garden, read, relax. I can't do it."

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Shoes, ribbons are sprayed to match dancers' flesh tones. Stephanie Dabney powders hers to conceal wear.

He prevailed on her to come to New York for "just a couple of weeks." That was seven years ago and she is still there. "I am listed as Special Administrative Consultant," she says, "a made-up name, and there is no way on God's earth you can define it. But I love the organization. I wouldn't be here if I didn't." She works with the board of directors and on planning, staff development, the budget and, most important, fundraising.

Money is always a problem. For example, estimated costs for the trip to the USSR were $1.5 million. The company went there under the auspices of the USIA, which gave them logistical support and $20,000. The Soviet contribution to the tour was $920,000. That left a shortfall of about $600,000, which DTH had to raise—this in addition to its annual $2.5 million fund drive. An appeal by a "Soviet Tour Support Committee" that included, besides the expected names, sports figures like Martina Navratilova, "Magic" Johnson and Greg Louganis, had a good response. One way or another, they made it.

On their way to the Soviet Union, the company stopped in Paris for six performances before enthusiastic audiences at the Théâtre du Châtelet.

In Moscow, lines formed hours before the first tickets went on sale. Most people talked about the color of the dancers' skin. Blacks are few in Moscow and prejudice is not unknown. But after the first performance all talk centered on how spectacularly they danced—on their speed, precision, strength.

Backstage, bouquets from Raisa

Among the audience on opening night was Raisa Maksimovna Gorbachev, wife of the Soviet leader. She went backstage at intermission to meet Mitchell and shower him with praise and questions. When he demurred from naming the best American ballet company, she said: "You may feel that you can't say which company you prefer, but I can tell you what I think—and I think the Dance Theatre of Harlem is the best."

People contrasted the energy of the company with the lethargy that sometimes overtakes performances of the Bolshoi Ballet. At a dress rehearsal the afternoon of opening night, there were many dance students. They said that not only could they not maintain the speed and precision demanded by the company, they never imagined anyone else could. Julia Kazlova, a student at the Moscow School of Ballet, said: "These are techniques and talents we have never seen."

"It's really due to the hard work and dedication of the dancers, the staff, the community and the people who believe in us," is Mitchell's way of giving credit. Certainly the dancers deserve a lot of it, especially those who have been with him the longest. Virginia Johnson came to him 19 years ago, after studying with Mary Day at the Washington School of the Ballet. Despite her modest place among the alphabetically listed "Dance Artists," she is preeminently the company's star, one of the top dramatic ballerinas dancing today. Her intensity burns through every role. "It's wonderful to be able to tell a story with your body," she says. "And I think this is the most exciting company in the country." Lorraine Graves says that, as ballet mistress, "I am basically Mr. Mitchell's assistant. But I'm a dancer first, and I have to make time for both." Stephanie Dabney came to DTH immediately after graduating from high school in Youngstown, Ohio, where she had studied until the director of the dance school informed her that, as a black, she had no future in ballet. She rejects the notion that there is anything intrinsically black in the DTH style. "We're not a black company," she says; "we're an American classical ballet company that happens to be black."

Eddie J. Shellman grew up in New York, where he went out for competitive track and field, especially the

high jump. He began attending dance classes in his early teens because his mother told him it was good exercise, but he quit for a year and a half because the boys in his neighborhood began calling him "Twinkletoes." Although he went to the High School of Performing Arts, he was determined to compete in the Olympics—until he was given tickets to a Maurice Béjart ballet. The men's technique so overwhelmed him that he resolved to become a ballet dancer. He has learned, he says, that dancing is more demanding than any sport. "It's particularly hard on men, who have to run and jump and lift the women. Our bodies are constantly pushed to extremes but, unlike in sports, we can never show pain or even exertion." Yvonne Hall, who along with Cassandra Phifer is one of the original members of the company, has always been interested in science and almost attended the Bronx High School of Science (SMITHSONIAN, May 1985). But dance came first. "College can happen later," she says, "and probably will." Lowell Smith had his first dance training in Memphis, attended the North Carolina School of the Arts (SMITHSONIAN, March 1981) and danced with the André Eglevsky and Alvin Ailey companies before Mitchell lured him to DTH. His impressive presence enlarges any role. "This has to be the most supportive company anywhere," he says. "When I'm onstage, 20 or 30 people are in the wings urging me on. It's not so much a company as a family."

But Mitchell dreams of a more extended family. "What I'd really like to have," he says, "is an international school of the allied arts. I'd bring children from all over the world"—presumably two by two—"and call it Noah's Art. I'd put together a company with these young people and tour the world to show that regardless of race, class, creed or color, it's the quality of what you do that's important. As I always say, 'You hit the high C or you don't hit the high C, whatever the color of your skin.' "

Dreams. Noah's Art. And on West 152d Street, where Mitchell owns two empty lots and a small apartment house, he dreams of an Olympic Village of the Arts. Well, why not? "When you face a challenge, it's belief in yourself that's important." And Arthur Mitchell believes.

During Arts Exposure lecture-demonstration, Eddie Shellman shows children how movements of their social dances can apply to ballet. The most talented young people are sometimes offered admission to DTH classes.

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By Doug Stewart

For a portraitist, making faces is a hard day's fight

Keeping things in perspective is difficult for artist and subject after hours of posing, but it helps if you have a sense of humor

One summer some 30 years ago, Elsa Maxwell, the noted bon vivant and party-giver, was resort-hopping in Europe with a portrait painter in tow, one Constantin Nepo. Sittings for the portrait began in Monte Carlo and continued in Venice, where an ornate palazzo had been chosen for the background. Maxwell posed two hours a day, adorned in an elaborately beaded dress, an emerald necklace and a borrowed diamond tiara. It was to be a portrait in the grand style.

After several weeks, Maxwell realized that something was terribly wrong. She asked her personal assistant, Jeremyn Davern, to speak with the artist. "I told him, 'Miss Maxwell isn't totally satisfied with her portrait. She represents fun and gaiety and laughter, and she feels you have captured her during an unaccustomed moment of sadness,'" Davern recalls today. The painter replied that he painted what he saw: his jewel-encrusted subject rarely smiled.

Davern now works at Grand Central Art Galleries in New York City, dealing in commissioned portraits, and she has witnessed other such disputes over artistic interpretation since that summer. "A lot of people think of themselves as art critics," Davern says, "and the more you know about art, the more likely you are to choose an artist who's hard to deal with." In the world of portraiture, an artist who is easy to deal with is one who gives the clients what they want and leaves out what they don't want (ten pounds, perhaps). For her part, Davern tries to stay above the fray. "I like attractive people, and I like attractive art," she says diplomatically.

John Singer Sargent, America's best-known portrait painter and a cofounder of the Galleries in 1922, is said to have referred to his craft as a "pimp's profession." To many artists, the very idea of taking money to paint a person's face is akin to making a pact with the devil. If art is the expression of a vision from within, say the purists, how can an artist let the model call the shots?

Alone among other fine artists, the portrait painter must satisfy two conflicting aims: making good art and making a good likeness. "Exactitude is not the truth," said Matisse, who was after truth. Yet a good likeness—or worse, a flattering likeness—is what most sitters are paying for. A portrait painter always strives for a likeness, of course, but how successful the painter is in achieving it depends on whom you ask. Lyndon Johnson judged his first official White House portrait, by Peter Hurd, "the ugliest thing I ever saw." Winston Churchill's reaction to a Graham Sutherland effort was to order it destroyed.

Still, despite the well-publicized failures, despite the taint of flattery, there is something indisputably powerful, even magical, about a well-painted portrait, and there always has been. "I would rather see the portrait of a dog that I know, than all the allegorical paintings they can show me in the world," said Samuel Johnson.

Amusing projects for the best painters

That special pull that a portrait can exert is what provides the talented portraitist with customers who normally might never set foot in an art gallery. "My biggest joy is when we have someone burst out crying when she sees a finished portrait of her husband," says Rutgers Barclay of Portraits Inc., a combination gallery and portrait brokerage on Park Avenue that represents more than 100 artists. Barclay himself is a dealer in European masters paintings, but since he and his wife inherited the gallery a few years ago, he's found himself spending more and more of his time running the business. He concedes that commercial portrait paintings are scorned by much of the art world, but he is remarkably undefensive about it. "I'm just trying to get the best painters I can find and give them some amusing projects," Barclay says cheerfully.

The gallery's staple is the boardroom portrait: formal, dark-suited renderings of soon-to-be-missed corporate leaders. The gallery has arranged the painting of several White House portraits, and the staff was dismayed when President Carter once suggested a

Patty Carini, a stunning beauty on canvas, throws Ron Sherr a different look as he turns to his palette.

Photographs by Richard Howard

All eyes are on Mary Joan Waid, who looks for the inner person by talking with her subject while she paints.

switch from oils to photographs for Cabinet officers. "Of all the economies the government didn't need to do, that was one of them," Barclay says.

At the lower end of the spectrum, Portraits Inc. runs a handy mail-order portrait business. Clients can send in a snapshot and a check (hands are extra) and receive a finished canvas a few months later. One man, apparently a sanitation mogul, walked in with a photograph of a garbage truck and another of a British manor and ordered a portrait of the truck parked in front of the mansion. Barclay is unenthusiastic about that sort of transaction. Nor is he altogether comfortable with the customers who burst in the front door, glance around the gallery and, pointing at various portraits, say, "I want that size, this pose and that feeling. Set it up."

"The idea of sitting for a portrait is becoming more and more unfamiliar to people," Barclay says. "Many people just won't do it." CBS chairman William Paley recently sat for a portrait by Aaron Shikler, at $85,000, one of Portraits Inc.'s top-priced artists. Shikler, who refuses to work from photographs—who refuses even to work under electric light—had to schedule each sitting individually by phoning Paley's secretary for an appointment.

To keep the customers happy, Barclay stays clear of what he calls the "freakier" painters, artists along the lines of Philip Pearlstein, Red Grooms or the late Alice Neel. Says Barclay: "Their paintings don't look much like the person, but they're works of art, I guess." Andrea Ericson Hogan, who helped run the gallery for 37 years before Barclay took over, recalls a wealthy older woman who commissioned Salvador Dali to paint her portrait (not through Portraits Inc.). "He painted her dressed in rags with men dripping from her fingers," Hogan says. "But she wanted a Dali."

A scandalous portrait of Madame X

Both Portraits Inc. and its crosstown rival, Grand Central Art Galleries, have experienced a surge of interest in portraiture in the wake of several recent Sargent exhibitions. "People started coming in wanting something like *Madame X*," says Barclay, referring to Sargent's scandalous portrait of a heavily powdered society matron posing theatrically in a low-cut black dress. In fact, hanging in a prominent position on Portraits Inc.'s back wall, at least until its subject moves to an apartment with a room large enough to accommodate it, is a portrait that Barclay calls a "*Madame X* derivative," a striking three-quarter-length painting of a young woman in a black evening gown.

Later, I arrange to meet the subject of the portrait, Roxana Robinson, at the gallery. Though the likeness of painting and sitter is evident, I have trouble at first reconciling the two. Roxana is slight, quiet, serious

Metropolitan Museum of Art

The public looked askance at John Singer Sargent's *Madame X* (detail) in her revealing black gown in 1884.

A demure Roxana Robinson sits by the *"Madame X* derivative," as Ron Sherr portrayed her on canvas.

and bundled up. *Roxana* has a lot of bare skin, long black gloves and what appears to be a diamond-studded choker. Robinson explains that the portrait, painted by New York artist Ron Sherr, was her husband's idea. "I think it has to do with feelings of possession and chivalry and woman-as-beautiful-object," she says, finding the idea of sitting for a portrait quaintly outdated.

The first time Robinson went to Sherr's studio to sit for the painting, she was distinctly uncomfortable. Raised as a Quaker, she wasn't accustomed to devoting so much time to her own appearance, sitting in a strapless evening gown before a stranger who was staring intently at her. Six months and 30 sittings later, Robinson and Sherr were as familiar with each other as two inmates sharing a cell. During the sittings, however, there was an uneasy balance of power. "It was a bit like being with a shrink or a hired sailboat captain," Robinson explains. "You're paying him money"—in this case more than $10,000—"but he's in charge." Her pose forced her to spend hours looking out the window of the studio. During one of the final sittings, she remarked that she knew every stone in the church across the street. Sherr replied, "How do you think I feel about your face?"

Sherr recently began work on another large (54-by-40-inch) portrait, and I drop in one afternoon at his Tenth Street studio to see what a portrait-in-progress looks like. Patty Carini is standing in one corner wearing a black scoop-necked knit dress with a pink sash around her waist. The portrait will end at the knees so her white high-topped sneakers won't be visible. This is the fifth sitting, with at least 20 more to come.

"I really love this dress, but when this is over I'll probably never wear it again," says Carini from her corner as Sherr, holding a spray of nine brushes in his left hand, dabs paint with his right.

Sherr explains that he needs a great deal of time because he's creating a life-size likeness and he needs to collect information. "A portrait is thousands and thou-

Massachusetts writer Doug Stewart, who has never had his portrait painted, thinks a well-painted likeness is something miraculous, despite what some experts say.

Rutgers Barclay believes that "the idea of sitting for a portrait is becoming more unfamiliar to people."

Tate Gallery

Sir Peter Lely's *Two Ladies of the Lake Family* (detail) exude idealized beauty typical of 1678 art.

sands of strokes," he says, "and each stroke requires a decision." Toward the end, he'll move the easel to within a few feet of the sitter, studying skin and hair and textures with the eye of a scientist.

Unlike some scientists, however, a portraitist who works from life needs to keep the object of his painstaking studies alert and, if possible, animated during the course of the sittings. Ron Sherr keeps his stereo tuned to rock 'n' roll or Classical depending on his mood or his subject's. Painter Elaine Wing of Santa Fe, New Mexico, makes her sitters chew gum. "I don't really know a person's face until I know how it moves," she says. With introverts, she often schedules sittings for lunchtime so she can watch them eat. Other portrait painters have taken more drastic measures to get behind their quarry's facade. Alice Neel kept her sitters off-balance by probing with personal questions. She then painted their "retaliation," she said, to what the world had done to them. The European painter Balthus once greeted an arriving model (a paid one) by lunging at her and ripping at her clothing, the better to provoke an artistically interesting look of distress.

Mary Joan Waid doesn't attack her sitters, but she certainly invades their space. If Ron Sherr's recent life-size oils are the epitome of contemporary society portraiture, Waid's pastels are the last word in facial exploration. She had been working on a series of dramatic close-ups of flowers, which she found added an element of freshness and mystery to the drawings. She realized the same would be true with humans, she explains when I visit her Soho loft. "If you look at this drawing of Henry over here"—she points to a large pastel with an enormous eye in one corner, the rest of the picture being mostly cheek and neck—"it reveals a lot more about Henry than if you saw his entire face. It makes you really *look* at him."

Waid's loft is lined with huge pastels and a few large oil paintings. Most of the drawings are diptychs of faces, or sections of faces, with each side of the diptych drawn from a slightly different perspective, making the face seem to fold in or open out disturbingly. Waid has drawn double portraits in which a wife's right side is juxtaposed with a husband's left. Sometimes she draws just necks and shoulders. "I'm looking for the

Portraitists of Lely's time often used underlings to paint interchangeable hands and backgrounds.

Ralph Wolfe Cowan

Ralph Cowan's portrait of Ronald Reagan was done for Imelda Marcos; he calls style "romantic realism."

inner person," Waid says, as I stare up at the eyes and eyes stare back.

To demonstrate her normal viewing range, Waid brings her chair directly in front of mine and watches me contentedly from 18 inches away, our knees almost touching. Looking across at her, I gulp and laugh nervously, trying to hold up my end of the conversation. "Isn't this making you uncomfortable?" she asks after a while.

Sitting for a Mary Joan Waid portrait is, understandably, not a relaxing experience. "The whole time we're working, we're talking," she says. "Instead of being like light conversation over dinner, it's an open-ended, stream-of-consciousness interaction. It becomes a little like therapy." Waid has only done a handful of commissioned portraits so far, at up to $6,000 apiece, and the reaction from her sitters has been mixed. One young woman wondered if she were really that hard-looking. Another promptly went on a diet. A man in his sixties remarked that he hadn't realized how old he had become.

Most folks shopping for a portrait painter aren't looking for such a heavy dose of reality. Many are content with just a touch. Andy Warhol's silk-screened photo-portraits are a case in point. His high-contrast Polaroid-camera technique burned out wrinkles and large noses completely, and clients naturally loved the result. Portrait painter Ralph Cowan of West Palm Beach, Florida, takes matters a step further. Cowan, who bills himself as "Royal Portrait Painter to the World," specializes in portraying his subjects as wind-swept matinee idols. Employing a style he calls "romantic realism," Cowan has painted heroic full-length portraits of the Reagans (for Imelda Marcos), three portraits of King Hassan II of Morocco and several of Pope John Paul II, one of them apparently set in heaven. Cowan works almost entirely from photographs. "Even with a head of state, I don't like to stare," he says.

Cowan's genre is part of a grand tradition. In centuries past, there were painters at every royal court who knew how to bestow on frail and stocky rulers alike the imperious look and tapered torso of a born warrior. Before photography, of course, a portrait carried tre-

Paul Ingbretson dreams of painting landscapes, "out in the woods all day . . . nobody's bothering you."

mendous force; what we think of Henry VIII or Napoleon depends in large part on the air of regal authority suggested in their portraits.

Sir Anthony Van Dyck, court painter to England's Charles I during the 1630s, was a subtle master of flattery in oils. Aided by a staff of assistants, Van Dyck produced nearly 40 portraits of his king: Charles at the hunt, Charles on parade, Charles in his robes of state—always graceful, detached and self-possessed. "Together [Charles and his portraitist] set forth the Stuart doctrine of the divine right of kings," wrote art historian Estelle Hurll in 1907. "For if Charles knew how to act the part, it was Van Dyck who made him look the part."

Where Van Dyck enhanced, his successors pandered. Women, once depicted as pious creatures, became alluring, heavy-lidded sirens in the paintings of British society painters. Without photographs against which to judge a painted portrait, artists were free to indulge in mass-produced expressions of idealized beauty. A slight resemblance was all that clients expected: the women in Sir Peter Lely's various portraits during the reign of Charles II look today like chubby-chinned identical twins. Portraitists used teams of underlings to paint interchangeable hands, drapery and backgrounds. In the years after the French Revolution, the immensely popular Sir Thomas Lawrence was particularly shameless in his efforts to romanticize his subjects, even by the standards of the time. According to a rival, Lawrence "made coxcombs of his sitters, and his sitters made a coxcomb of Lawrence."

"A little something wrong about the mouth"

Eventually, sitters began to demand that the flattery be more personalized. In his heyday at the turn of the century, John Singer Sargent was besieged with would-be sitters who admired his blending of deft realism with romantic elegance, a combination that the painter himself eventually found tiresome. "He complained that even when women did not ask him to make them beautiful, he could *feel* them wanting him to do so," wrote biographer Charles Merrill Mount. "He insisted that portraiture was not a game of hide and seek, but an art, and he was finding that the art of it was increasingly offensive to his sitters, who took the position that it was his duty to forge a pleasant mask behind which they might hide." Tensions would often build over the course of the sittings, with Sargent growing more and more resentful of suggestions from the sitter. He once warned a client that a portrait was, by definition, "a painting with a little something wrong about the mouth." Eventually, Sargent refused to paint commissioned oil portraits altogether, referring to his vow as a way to "regain my manhood."

British society portraitist Augustus John was somewhat less successful at balancing the requirements of art with the requirements of earning a commission. When the actor Gerald du Maurier publicly rejected a 1928 portrait with the remark that it would drive him either to strong drink or to suicide, John remarked, "In my innocence I had omitted to repair his broken nose."

The painter who paints portraits on commission is obviously venturing into a sensitive area. One's face may not actually be the window to one's soul, but there's no question that it's a revealing bit of geography. To invite a portraitist to immortalize it in oils is to place oneself in a uniquely vulnerable position. Small wonder that so many portrait buyers prefer bland, heartwarming pictures to challenging, original works that may batter one's self-image in the name of art.

For workaday portraitists who lack illustrious patrons and insist on painting what they see, portraiture remains a laborious, uncertain way to make a living. The threat of rejection always intrudes. When the

If you think people might think you order Chivas to show off, maybe you're thinking too much.

12 YEARS OLD WORLDWIDE • BLENDED SCOTCH WHISKY • 86 PROOF • © 1988 CHIVAS BROS. IMPORT CO., NEW YORK, N.Y.

What are you saving the Chivas for?

Cox's storeroom housed rejected portrait of Henry Kissinger and a study of Michael Dukakis in profile.

total market for a painting can fit in a chair on the other side of the studio, an artist knows that a green nose can only be painted with permission.

"I had a businessman quit on me because I wouldn't get rid of his jowls," says Paul Ingbretson, a young portrait painter in Boston. Ingbretson was disappointed about the jowls: he felt he had captured the "beautiful roundness" of the man's features. One man's roundness, unfortunately, is another man's fat.

Most of Ingbretson's portraits are beautifully rendered, happily acquired works that result from a minimum of 14 sittings, more often 20 or 30. But like everyone else in the field, he occasionally finds himself in conflict with his sitters' vanity. Lately, he's been at odds with a teenager and her family over a dark shadow he painted under one of the girl's eyes. "My God, that's what gives her soul!" he tells me. Unfortunately, if he doesn't get rid of the shadow, future sittings are off. "Sometimes I feel like a child psychologist, even with the adults," says Ingbretson, who's painted his share of children.

Ingbretson says portraiture is his livelihood, but he sometimes wishes it weren't. "Dealing with people and painting at the same time is very stressful," he notes. He dreams of painting murals, as Sargent did after abandoning portraiture. "Or landscape painting—you go out in the woods all day, right where you want to be, and nobody's bothering you." Ingbretson envies the big-name painters who have freed themselves from the pressures of delivering nice-looking pictures. "That's one position a portrait painter would love to be in. 'I'm so-and-so. Do you want a so-and-so?'" He laughs. "No, they don't come to me with that. They come to me because they want a likeness of their daughter."

Dealer Marvin Sadik, a former director of the National Portrait Gallery in Washington, bemoans the lowly state of commercial portraiture today. A spitting image is not the same as a good portrait, Sadik points out, but most portrait buyers these days don't see the distinction. They mistake the banal for the miraculous, he says. "A lot of these painters have to be careful they've painted over the numbers," he snaps.

One American portrait painter whom Sadik singles out for praise is the late Gardner Cox. An archetypal Boston Yankee with improbably bushy eyebrows and an unofficial designation as court painter of Harvard University, Cox painted portraits for more than 50 years—long enough to have been working when portraiture was the most prestigious field a painter could choose. His sitters included Robert Frost, Henry Kissinger, Robert Kennedy, Michael Dukakis and seven Supreme Court Justices.

Cox's portraits were roughly textured works that strove to capture the telling gesture or pose—the finely tailored Cabinet secretary sitting back with chest out and eyebrow arched; the black-robed judge, arms crossed, gazing at the viewer with a skeptical eye. "A photograph is an historical fact, but a portrait is an opinion," Cox would say.

For Kissinger's official State Department portrait, Cox spent weeks in Washington watching and sketching the Secretary at work before any formal sittings began. Cox later suspected he may have seen more of Kissinger than his subject had intended. The finished portrait depicted a squat, unsmiling, eerily lifelike Kissinger standing with one hand held out, palm up, as though cradling a pipe. The other hand was hidden behind his back. Both gestures were characteristic, Cox had noticed, though he confessed he liked the symbolism. Kissinger reportedly felt the work as a whole "diminished" him. When the artist declined to make further changes ("I thought it was rather good"), he forfeited the $12,000 fee and received the gilt-framed painting by return mail.

Unlike some of his peers, Cox remained resolutely unapologetic about his vocation. "People are always talking about the end of portraiture, but I don't think there ever will be an end of it," Cox said shortly before his death in January at 81. "Good portraits don't ever go out of fashion. If they're good, they can be very good indeed. Sometimes when you're in a room with a great many portraits on the walls, the portraits may look better than the people do."

In his studio, Gardner Cox studied work in progress in a mirror to analyze it from a different perspective.

The camer

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LOWE TUCKER METCALF

Lineup of kite nestlings is about to be transferred from nests in town to new ones on the rural outskirts.

By Jim Parker

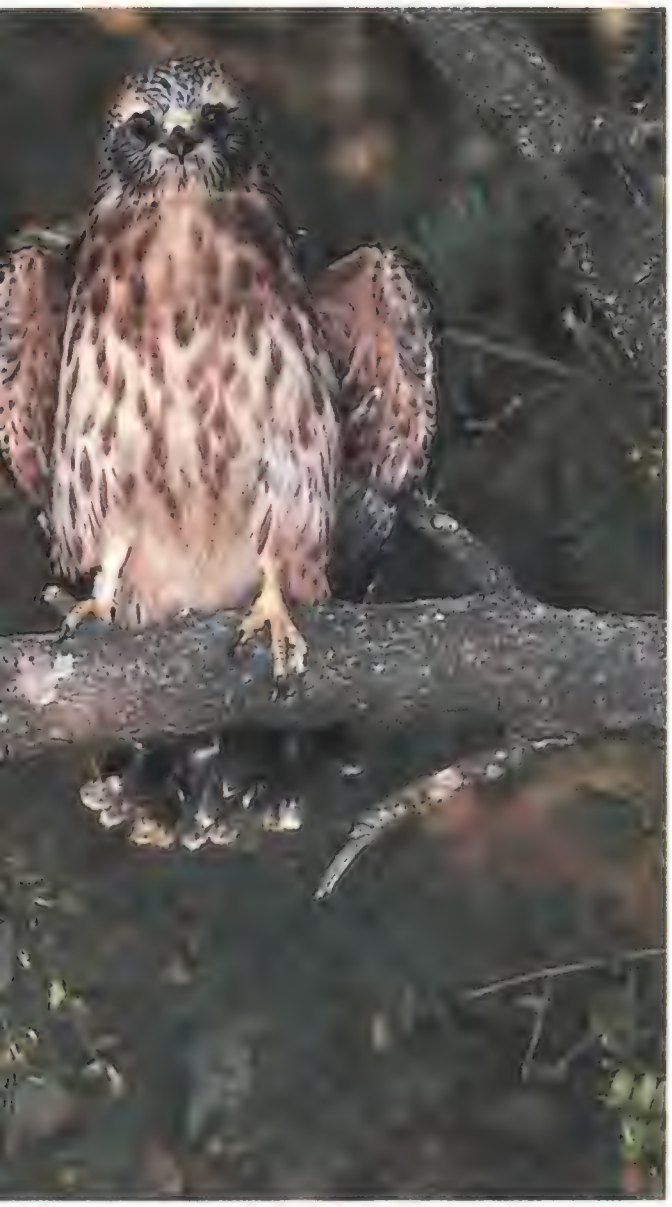
The ace dive-bomber of the prairie is a terror on the green

The Mississippi kite is making a startling comeback in Great Plains towns, but this agile aerial gymnast has one bad habit

We stepped from our covered golf cart and took a swig of cool fruit punch before I sent my 11-year-old daughter, Jerelyn, up the elm tree. It was small, neatly trimmed and ornamented with the twiggy nest of a Mississippi kite. Hard work this, gliding about the golf course looking for kite nests from the comfort of a cart—not what I was used to—but real field biology nonetheless.

As Jerelyn lowered the two chirping young kites into the green bag she and her sister, Jamie, call the "green stomach" (the nestlings must think they've been swallowed, they said), it occurred to me how curiously suitable it was for me to be here, taking a kite census on a golf course in Oklahoma and trying to solve a peculiar ecological problem. The kites, it seemed, were wreaking havoc on the greens, diving like Stukas on golfers and turning pars into bogeys.

I wasn't all that surprised, of course—fascinating behavior like this was among the reasons that, some 20 years ago, I was spurred into a study that may include the largest sample of nesting histories ever compiled for any raptor.



Their Dodge City, Kansas, parents were guilty of diving on innocent passers-by. At right, the author's daughter Jamie carefully returns young fledgling to its own nest after it was banded during a census.

This little hawk has weathered not only the massive agriculturalization of North American prairies, but also Man's irrational and persistent antipredator hostility. Indeed, the species' most noteworthy feature is that it has benefited spectacularly from Man's efforts to change the rural landscape. The kite happily lives at close quarters with us and, as a result, is unquestionably the most abundant raptor over much of the Great Plains.

I began my research as a graduate student at the University of Kansas in 1968, and ten years later, when I figured I knew more about the kite than anyone else would care to hear about (at least that's what one graduate adviser said), something very unexpected hit the presses—literally. Kites became urban pests; according to some, worse than raccoons or pigeons. So I became the authority to call for help.

The Mississippi kite may look and behave like a crow-sized falcon, but it is actually a cousin of the larger and more sluggish soaring hawk. An adult kite has unusual plumage, with a body and head of steely gray, the head accented by a black beak and black feather patches around eyes of shocking blood-red. The tail and most wing feathers glisten black. With patches of reddish brown near the wing tips and iridescent silver edging their inner wing feathers, kites exude modest elegance. The bluish gray coloring of the adults is probably the reason ranchers and farmers often call them blue darters, but like wildflowers they are called by a lot of local names: grasshopper hawk, blue hawk, locust hawk, Texas kite and Kansas kite.

The original breeding range of the Mississippi kite included most of the Southeast, where today it usually nests in old, lowland forests, especially along major rivers. In lesser numbers, it reaches as far north as southern Illinois and Memphis, Tennessee, where local populations are given endangered status.

But the place to go if you really want a good look at this aerial gymnast is not Mississippi, official name or not; rather, go west toward Abilene, Texas, or Mangum, Oklahoma, or Dodge City, Kansas. Throughout kite country—most of the prairies and oak savannas of western Kansas, western Oklahoma and north-central Texas—more kites are available than even the

Photographs by Cameron Davidson and Jim Parker

Ace dive-bomber of the prairie

A protective kite parent zeroes in on a golfer, whose hat will soon be knocked off by diver's low pass.

most avid of bird-watching aficionados could wish for.

Strangely enough, the reason for the kite's current resurgence is rooted in the aspect of human biology that most often causes problems for wildlife—our own population expansion and urbanization. Settlers moving onto the prairies planted trees. Thousands of small forests, called windbreaks or shelterbelts, now dot our Great Plains, and the kites have moved in.

The largest local population of kites I know of uses the tall cottonwood trees in Lake Meade State Park. This southwest Kansas park is an ecological oasis in a sea of grass and cropland. On a gusty day in July 1968, at the height of the kites' nesting season, I tallied 108 kites over the 50 acres of trees. I began my study there and have returned every summer, establishing my field camp in the decrepit building that was once used as a Civilian Conservation Corps (CCC) camp. Now the thousands of big trees, planted and tended daily by the camp workers in the 1930s and '40s, offer a paradise for Mississippi kites. The original kite population, about 10 birds, used a small grove of cottonwoods at the artesian spring. Having grown now to ten times that size, the kite colony is a microcosm of what has happened throughout much of the Great Plains.

The kite population has also exploded in prairie towns. But kites don't just nest on the outskirts; they infest the towns, using trees in residential backyards, courthouse lawns, the town square, traffic islands and, most enthusiastically, golf courses.

It's clear that town nesting holds significant benefits for kites, but to understand why it is necessary to understand their problems. Kite nestlings die at a prodigious rate; only one egg in four becomes a fledgling.

Weather and predators destroy many nests

My periodic visits to nests have provided grisly reminders of the perils. I've seen dismembered nestlings in the nest or scattered below on the ground, chilled bodies of nestlings amid the fragments of a dislodged nest, eggs broken and soaking into the sandy soil, or nests unaccountably empty. It's often impossible to pinpoint the exact cause, but it's usually clear that either weather—strong winds, heavy rain, hail—or a predator is the culprit.

It may seem strange that adult kites can't always protect their eggs and nestlings during storms, but what they're up against was made clear to me in July 1972 when my wife, Jane, was working with me in Meade Park. It was 2 A.M., and the winds exceeded 70 miles per hour. Tall cottonwood trees and branches were crashing all around the flimsy CCC building. Jane and I felt like Dorothy and Toto in *The Wizard of Oz*, riding helplessly in the middle of a tornado. At sunrise we began providing emergency medical care for the

Author removes nestling for measuring; he has documented nearly 1,000 birds during 20-year study.

The "green stomach" (actually an army-surplus bag) is used to lower a 10-day-old bird from its nest.

nestlings. The adult kites were soggy and shell-shocked, most of their nests destroyed. Since kite nests are not particularly well constructed, and prairie storms are violent, the toll is considerable.

Adult kites also try to protect their young from a devastating collection of predators. During the day few predators can get to a kite nest without drawing the ire of mama kite, usually the more protective parent. The trouble comes when both adults leave the nest, even for a short time.

Bull and coachwhip snakes are agile climbers, often big enough to swallow kite eggs, which are slightly smaller than chicken eggs. Fox squirrels, climbing pack rats and even ants threaten eggs and small nestlings. Surprisingly, blue jays and grackles will harass an incubating kite for five to ten minutes at a time, diving, pecking and often hitting its back. The parent kite usually sits tight. Otherwise, its eggs would be omelets.

All daylight predator threats pale compared with those that come by night, when kites can only die with their eggs or nestlings. The bad guys are great horned owls and large, climbing mammals—raccoons, probably bobcats and possibly feral house cats. The evidence is unmistakable, and the impact on a kite colony can be devastating. In 1970 I witnessed the demise of an entire colony at Lake Kemp on the Waggoner Ranch in Texas. One nest after another fell to a great horned owl over a two-week period.

I thought this kind of occurrence would prove rare but I've witnessed several such massacres, largely because great horned owls appear in one out of every four shelterbelts. In a large one I studied, the number of kite nests dropped from 15 to 4 within a few years. I always found one or two great horns in residence there, and I questioned why any kites remained. Their persistence was a tribute to nest-site tenacity but seemed maladaptive in this case. For a great horned owl, locating a kite colony is Christmas in July.

Another nocturnal predator can be equally dangerous. I found the scant remains of an adult kite strewn on the ground beneath a low nest in a shelterbelt near the Brazos River in Texas. My accidental glance into the lowest fork of a nearby mulberry tree disclosed a sleeping raccoon. Completely unintimidated by my presence, when I poked it with a pole it only turned, burped and resettled, but I caught the smell of kite on its breath.

The widespread impact of storms and predators helps explain why Mississippi kites have evolved a low reproductive rate. Other of my studies suggest that

Author-photographer Jim Parker is a population ornithologist and environmental educator whose career has centered around his study of raptors.

A "kite kid" helper gets ready to remove nestling from its twiggy home for a brief physical exam.

Kites thrive in the shelterbelts planted during the 1930s and '40s to stop soil erosion on the Great Plains. kites usually live long lives, ten or more years, if they make it through their first year or two. In other words, adults potentially have lots of chances to nest, and it's probably better not to risk one's neck too much in any one year. Better to live to try again next year.

I was most curious to learn why town nesting holds such big benefits for kites. In the town of Meade it certainly wasn't the social life. From my comparisons of the reproductive success of rural versus towny kites, it seems that the urban populations are raising more young. My best explanation is that most of the big predators shy away from towns, and the density of the trees there provides more protection from prairie storms.

Town nesting does have one unexpected and now well-known liability. Kites have only one tactic to defend their nests against the larger carnivores. I refer to it—in today's military-political jargon—as a preemptive strike, most often aimed at owls. A flying owl is clumsy and vulnerable. The first kite to see it immediately becomes a screaming banshee while pursuing at flank speed, and is quickly joined by every other kite that sees or hears the commotion.

They gather from everywhere and in rapid succession overtake and often strike the lumbering owl, sometimes so violently and persistently that it's driven at full speed to the ground, tumbling over and over before regaining footing. Understandably then, kites also dive at human "intruders"; they probably compute us as oversize predators.

I enjoy being targeted by a kite's kamikazelike attack, but admittedly my complacency comes from years of experience climbing to their nests. I did, however, feel unpleasantly vulnerable one hot afternoon in Oklahoma as I stood on a tree limb looking into a nest in a gnarled oak on a small prairie hill—my head the highest point around. The female kite knew me intimately from past visits and was not pleased; she dove at my car when I was still a half-mile from her nest tree. Now, my only shield was a sweat-rotted Stetson. She came at me, directly into the wind, in level flight like a cruise missile. She didn't hit me, but the miss was by less than a few inches.

Years later I met another female kite, "Big Mama," who matched the Oklahoma bird's aggressiveness. For years she nested in the shelterbelt of one of Meade's many Mennonite farms. She was unstoppable and

preferred me as a target over any of my assistants. Only once did I slow her down. I wanted to band her, and it was easy to catch her in a large net just before one of her dives. Once she recovered from the capture, Big Mama dove as enthusiastically as ever but now had two yellow wing-streamers flapping like battle flags.

Understandably, many people in dozens of towns in the Great Plains have no patience when confronted by the novel hazard posed by a diving kite. After all, hawks aren't supposed to nest in town and chase people out of their backyards.

The problem of urban diving first surfaced in the news media in 1978, in Ashland, a small town in the Red Hills of southern Kansas. Because of kites diving at people, an overzealous posse killed (illegally and needlessly) 28 kites. It was easy. When a kite dives at a person, as at an owl, others tend to gather. It didn't matter that only one or two did the diving. To celebrate the "victory," the posse stopped at a local café with a pickup truck full of dead kites. The story of the town's rescue spread, and somebody told the Feds. The victors had broken the law. The international Migratory Bird Treaty Act, which has long protected our songbirds, had been expanded in 1972 to protect all birds of prey, including kites. The ensuing legal actions pitted state against federal fish and game officials, as well as pro-kite citizens against those who supported the vigilantes.

In the years since, diving has erupted in scores of plains towns. Even here in Farmington, Maine, nearly 2,000 miles from kite country, it's been easy to collect a file of more than 40 newspaper clippings since 1983, many of them, despite considerable efforts at public education, invoking Alfred Hitchcock's movie. *The Birds* should be banned from the shelves of prairie video stores.

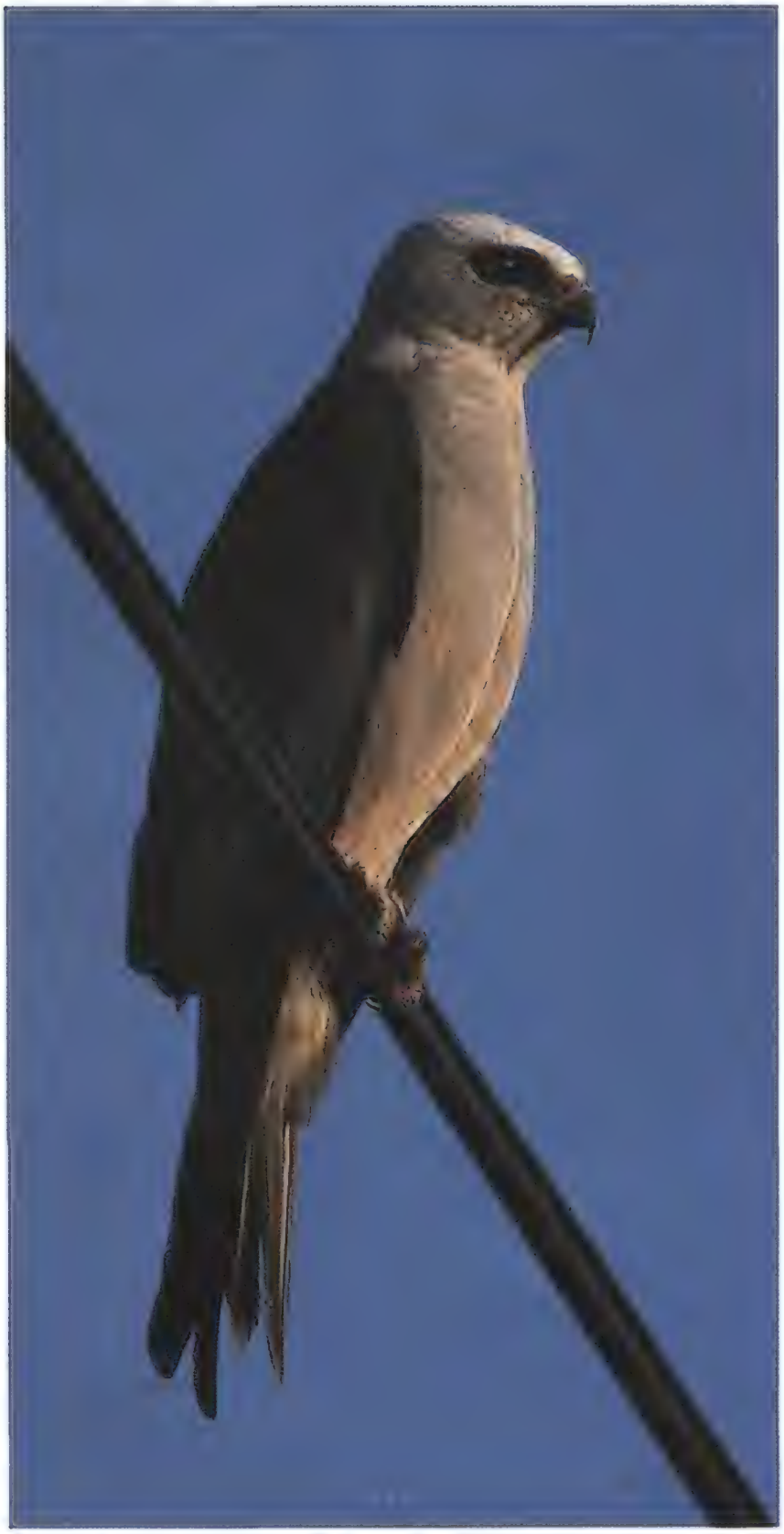
Exaggerated reports of kite diving

Despite hundreds of hours in the field, never once have I been hit by a diving kite. Close calls yes, touch no. Initially I was incredulous when I heard claims of lacerated scalps, snatched hairnets, hats knocked off, senior citizens "terrorized" as they tried to maneuver their walkers down porch steps, and frightened and distracted children having bicycle accidents. But there have, in fact, been rare instances of urban kites punching or taloning people. Particularly targeted are small intruders like women, children and dogs; or those who regularly pass nest trees, such as mailmen and golfers. Shades of Big Mama! Almost always, though, the problem is just a matter of people being frightened by kites unexpectedly zipping past their heads.

The most vitriolic and persistent complaints come from golfers. Kites apparently see golf courses as artifi-

One of the nestlings in this group was moved from another nest, but it will be cared for nonetheless.

Parent kite returns from successful hunting trip with a cicada morsel to feed its ever-hungry young.



Adult Mississippi kite perches above Meade, Kansas; there is one of them for every 30 people in the town.

cial savannas—the best of all possible nesting worlds. Last summer, I counted 15 nests on the nine-hole course at Altus Air Force Base in Oklahoma. There's something about the sunburned bald head of a golfer that kites can't resist, particularly when the golfer uses his club to swing at them. It's not just that the game is disturbed; being interrupted while making a putt provokes a golfer's territorial ego. A survey of the reactions of golfers at the Clovis, New Mexico, golf course produced the suggestion, "Let me bring my shotgun and shoot the scumbags out of the sky."

Three things are clear. First, kites need an ongoing public relations program to explain their behavior and to encourage tolerance. Second, it's certain that the kites won't stop diving. With the higher breeding success going to the urban instead of the country kites, the kite of the future is the towny. Third, the diving *is* a problem. Even though a kite rarely does serious damage to a person, the perception of a threat by the public is real and something has to be done about the diving.

On my way to Kansas to help solve the kite problems of Stan George, superintendent of the Dodge City Country Club golf course, I reviewed the options that had worked for me before. First of all, it is easy to avoid being the target of a hit or dive: wear a hat, hold something above your head, wave kites away as they dive, or just avoid the nest area. The diving doesn't last long and the attacks usually end when the young leave the nest. Many people willingly modify their behavior, particularly after I show them a captive live kite.

Plains golfers have a real problem

Unfortunately, the main complainer—the golfer—cannot putt with a hand in the air or stay away from the sixth hole. In Dodge City, Stan was relieved to see us. Last year we had solved his problems on two greens, and now more kites were diving. A trio of nests paralleled a fairway, and golfers were being harassed from tee off to final putt. Originally Stan was the main target, but now the kites were going after any golfer, including the golf pro, who supported the shotgun approach. Country club politics were heating up, and something beyond education seemed in order.

I decided to try one of my most successful methods. It's simple, guaranteed to work, and no birds are killed. Using the green stomach, I took the nestlings from the nests of the divers, destroyed the nests and placed the orphans with foster-parent kites in rural nests. They were accepted and raised routinely. It sounds heartless, but it works in situations where active management is imperative. The adults live to nest again, as is often true when kites lose their young to natural predators, but the chance they'll renest in the same spot is minimized.

I pioneered this transplant technique after the severe storm in Meade Park. I was desperate, having been left with orphaned nestlings; I had no desire to hand-raise them. In a three-year field experiment in which nestlings and eggs were rearranged among nests, my idea was to see if the kites could capture enough food to raise a brood of three young instead of their natural maximum of two. They could.

I am not alone in trying innovative solutions. When kites moved onto the Clovis, New Mexico, golf course, Tony Gennaro of Eastern New Mexico University

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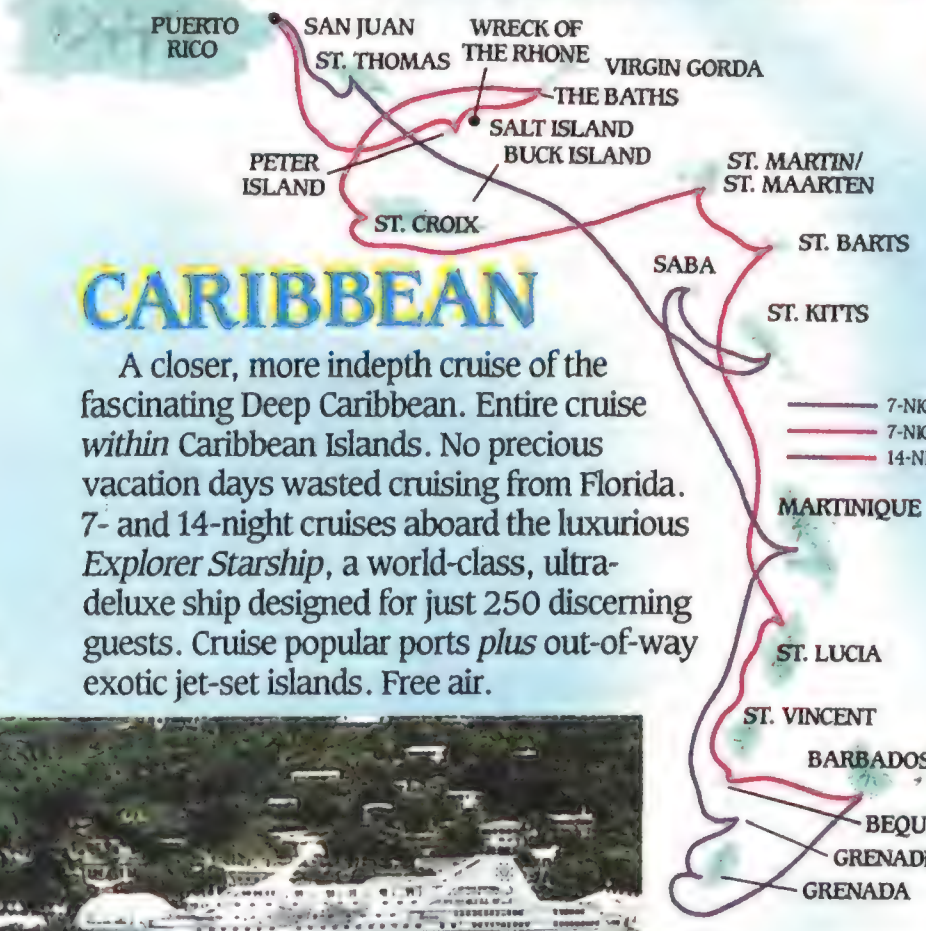

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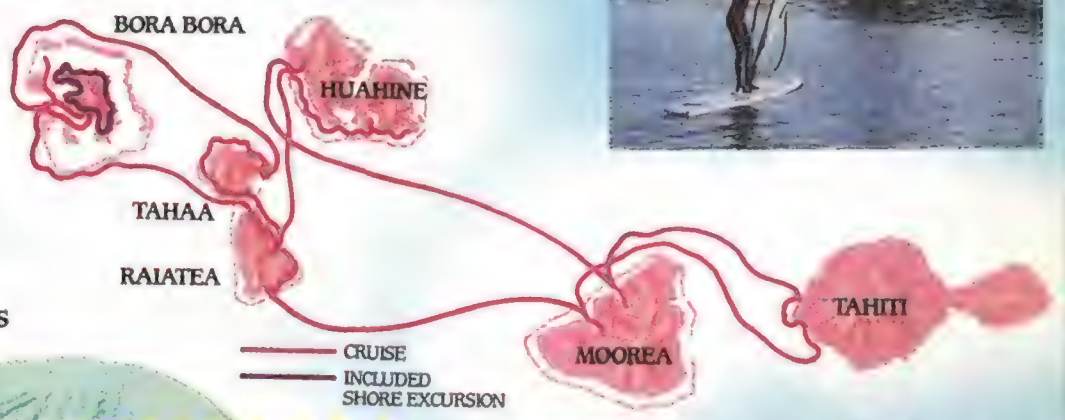

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Ace dive-bomber of the prairie

An agitated kite is caught without injury in a mist net that's used exclusively by researchers for banding.

built models of incubating kites. Although kites aren't always territorial, they avoided a model kite in a real or dummy nest, and were discouraged from nesting near specific greens and fairways. Now the Clovis course is dotted with signs warning of major fines for harming or disturbing kites.

Surprisingly, the ideal model for golf course coexistence required no biologist or governmental interdiction. Common sense prevailed at Altus Air Force Base. There, the bottom line is that Lloyd (Hoppy) Hopkins, the course manager, likes the kites. Aside from Air Force tanker pilots, the most common wildlife species on the course are jackrabbits and kites. Not only do the golfers coexist with the birds, they also wear their likeness. The jackrabbit and kite are part of the golf course emblem—worn on hats and visors. My heart warmed when I saw four smartly dressed women solve their diving problem. As one putted, the others stood around her, with their clubs held vertically overhead.

There is still more about the kites I have found fascinating. Although defensive parents, they are tolerant of my photographic efforts. The kites permitted blinds within 20 feet of their nests, but they were incredibly alert to any matter of movement or sound, even the quiet thud of an ice jug—essential in the 100-degree heat—on the floor of the blind platform. Until the young leave the nest at about 35 days old, they don't have the option, as we did, to drink free water. They get their only moisture from the bodies of the prey brought to them, and they seem well adapted to the heat and drying winds that buffet the nests almost constantly. Pristine white natal down helps prevent overheating for what must be one of the cutest hatchlings produced by a bird of prey. My wife, Jane, suffered with me as a field assistant through the long, hot research summers of 1968 and '69. Had she not been able to fondle these diminutive balls of fluff, she might have jumped ship, and I would have been deprived of my best means of imitating the kites' vocalizations.

An operatic soprano mimics the kites' whistle

The alarm call of a disturbed Mississippi kite is a pure, high-pitched, two-part whistle. It tends to attract other kites, so being able to imitate it can be useful. Jane, an operatic soprano able to master Mozart's challenging "Queen of the Night" aria from *The Magic Flute*, renders the kites' "phee-phew" elegantly.

Until recently, kites were thought to eat only large insects. No one peeked, as I have, into hundreds of nests or observed a large number of feeding adults delivering food to nests. It's clear that kites opportunistically sneak a much wider variety of food from the prairie pantry: frogs, toads, lizards, snakes, bats, rodents, small birds and even road-killed box turtles.

Although male kites spend less time than their mates in incubation, they're more ambitious in delivering this diverse fare to the nest. Traffic back to feed the young can be intense and it doesn't let up after they're able to fly: fledglings persistently return to their nests, sometimes ten days or more after their first uncertain flights—like adolescents looking for a security blanket.

The kites' most interesting hunting tactics are aimed at insects, and a foraging kite can be the ultimate aerial gymnast. Their most spectacular tactic is the stoop, a high-speed dive. On several occasions I've left a shelterbelt, sweaty and exhausted after two hours of looking for nests, only to glimpse a kite hovering at 300 feet in a stiff wind. Suddenly it "peels off" into a screaming vertical dive, closing with the ground at incredible speed, corkscrewing with its wings folded back, looking like a bomb. At the top of a clump of grass or sagebrush, it twists abruptly upward to 30 feet and soars in circles, casually bending its head down to nibble a cicada held in one foot. All this for a bug.

In spite of its versatile diet and urban habits, the Mississippi kite is not a permanent resident in this country. By the hundreds and even thousands, kites flock together after the breeding season. We don't know their destination. Their winter haunts in South America are known only from about a dozen isolated sightings or dusty museum specimens.

At home on the outskirts of Farmington, Maine, I write and daydream about kites as an unexpected early March blizzard dumps its second foot of snow. One of the only kites spending the winter in North America, an injured bird dubbed "CP" (for Cabbage Patch kite) is living in my basement. I don't know about CP, but migration sounds good to me.

Waves of field biologists travel to the most exciting places on Earth, and emulate Indiana Jones. I, on the other hand, go back to Kansas. "I cannot understand why," the Scarecrow asked Dorothy, "you should wish to . . . go back to the dry, gray place you call Kansas." Walk the prairies at dusk. Have a cowboy breakfast at the Lakeway Lodge in downtown Meade the day of the annual Dalton Gang celebration. Drive along Route 54 going west from Wichita—it's every 10 miles a town. Over each town there's a kite, "makin' lazy circles in the sky." And consider the amazing ways the Mississippi kite has adapted to live with us. You'll understand.

In the brisk winds following a storm, kites sail playfully through the skies above Fowler, Kansas. They are the aerial gymnasts of the Great Plains, and their numbers are burgeoning in prairie towns.

Car and Driver calls it one of the ten best cars in the world.

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Have you driven a Ford...lately?

Ford

By Thomas A. Lewis

There, in the heat of July, was the shimmering Capitol

The year was 1864 and the South was all but beaten, yet Jubal Early's ragged army had Washington, D.C. within its grasp

Just six miles away, the Confederates massed three times as many men as the embattled Yankee defenders.

It may be altogether fitting and proper that the battlefield has come to this. A ragged half-block of grass surrounded by brick tenements and row houses, it lies between the main business district of Washington, D.C. and the burgeoning suburb of Silver Spring, Maryland. When I visited there last, I was greeted by a couple of hundred feet of eroding breastworks and concrete replicas of a half-dozen gun platforms, awash in fast-food wrappers and broken glass. Instead of uniformed guides there were the flat stares of four men pulling frequently on a large wine bottle.

It is not hard to be reminded here of lost causes and wasted lives; of how events often reel crazily away from the people who set them in motion, battering down winners and thrusting losers toward greatness. So what is left of Fort Stevens may be precisely the right memorial for the curious confrontation that occurred here, and for the weary men who led it.

To Lieut. Gen. Jubal Early of the Confederate States Army, at least for a little while that day, it must have seemed that the war was young again. In the noonday heat of July 11, 1864, the commander of the battle-hardened II Corps of Robert E. Lee's Army of Northern Virginia sat his horse on a rise of ground in Maryland and saw, shimmering in the heat waves just six miles to the south, the luminous dome of the United States Capitol. Immediately in front of him were the frowning works of Washington's formidable ring of defensive entrenchments. A glance told him, he wrote later, that they were "but feebly manned."

It was a year and a week after the fateful Confederate defeat at Gettysburg, four months after the advent of Ulysses S. Grant as the Federal General in Chief, and a month since Grant's armies had begun hammering at Petersburg, south of Richmond. For some time, in other words, there had been for the South precious little glory in this war and even less fun. The proud young men strutting to the music of the bands were no more; now sad-eyed, leather-skinned, worn-out infantrymen stumbled barefoot through the heat and dust until they dropped. The caped and ostrich-feathered officers, happily risking all for home and country, were dead, replaced by bitter shells of men playing out a losing hand.

Jubal Early was going to take the nation's capital—
its Treasury, its arsenals, maybe even its President.

And yet, by God, here at midday on a Monday in July was the balding, foulmouthed, tobacco-chewing, prophet-bearded Jubal Early, at the gates of the Federal capital. He had taken command of the men who had earned immortality as Stonewall Jackson's "foot cavalry," had marched them far enough and fought them hard enough to rival the memory of their dead commander, and now he stood on the brink of legend himself. He was going to take Washington City—its Treasury, its arsenals, its Capitol building, maybe even its President.

Even better, he was going to lift some of the crushing burden from the shoulders of his chief, Robert E. Lee. Beleaguered, almost surrounded, his sources of food and reinforcement slowly being choked off, his great heart failing under the agonizing pressure, Lee had asked Jubal Early to attempt two things, each of them a tremendous challenge.

First, reclaim the Shenandoah Valley from the Federal army that had managed, for the first time in the war, to occupy the granary of the Confederacy.

Then, if he could, invade the North again, as Lee had done in the campaigns of Antietam and Gettysburg, and raise such an uproar that Grant would be forced to detach part of his army to protect Maryland, Pennsylvania and Washington City; or attack Lee in his fortifications and risk suffering more of the slaughter that had stunned his army at Cold Harbor.

Illustrations by Arthur Shilstone

There were political as well as military benefits to be gained. The Union, heartily tired of war, would be electing its President in November. The likely Democratic candidate, George McClellan, was promising a negotiated peace while Abraham Lincoln was promising to finish the war no matter how long it took. If Early could embarrass Lincoln, deepen the war-weariness and brighten McClellan's prospects, he might assure the survival of the Confederacy.

The role of savior did not fit snugly on the tall form of the man they called "Old Jube." Thin and fierce, stooped by what he said was rheumatism, a confirmed bachelor at 48, he had a tongue that (when it was not caressing a plug of tobacco) rasped like a steel file on most sensibilities and a sense of humor that enraged as often as it amused. His adjutant general, Maj. Henry Kyd Douglas, admired Early's fighting abilities but saw him with clear eyes: "Arbitrary, cynical, with strong prejudices, he was personally disagreeable." It is remarkable, then, that before the war he had been a moderately successful politician and lawyer in his native Franklin County, in southwestern Virginia.

Professional soldiering seems not to have appealed to Jubal Early; he resigned from the U.S. Army in 1838, just one year after graduation from West Point, and went back only briefly in 1846 to do his duty in the Mexican War. He had argued caustically against secession and for the Union until his state seceded, whereupon he became an equally caustic supporter of the Confederacy and a colonel in its army.

It soon became clear that he was that rare commodity, a forceful and courageous leader of men in battle. This had been so at First and Second Bull Run, Antietam, Fredericksburg and Chancellorsville. As his commands increased in size, however, his touch became less sure and his luck more spotty. Yet such was General Lee's confidence that in 1864 Early had been given command of one of the three corps in the Army of Northern Virginia.

And now here he was, on the brink of history, about to quench the boundless thirst for recognition that glittered ceaselessly from his black eyes. Pursuant to Lee's instruction, he had chased one Federal army away from Lynchburg, Virginia, and clear into the West Virginia mountains where it disappeared. He met another near Frederick, Maryland, on the Monocacy River, and swept it aside. On fire with the glory of it all, forgetting his limited objective, Early now rasped out his orders to Maj. Gen. Robert Rodes, commander of the leading division: throw out a skirmish line; move forward into the enemy works; attack the capital of the United States.

Abraham Lincoln himself visited the fort and watched the sinuous dust clouds raised by enemy columns approaching from the northwest. "In his long, yellowish linen coat and unbrushed high hat," an Ohio soldier who had seen him at the fort wrote, "he looked like a care worn farmer in time of peril from drouth and famine." Far away to the south, the relentless Grant had refused to be distracted from his slow strangulation of Lee's army. On the whole, Lincoln approved; he had, after all, tried for three long years to find a general who would devote himself to destroying the enemy armies instead of striking attitudes and defending Washington. But it must have occurred to the President, that afternoon, that maybe Grant had gone too far.

A few months before, there had been 18,000 trained artillerymen manning the 900 guns and guarding the 37 miles of fortifications that ringed Washington. Grant had taken those men for harsher duty in the trenches in front of Petersburg, and now, on the threatened north side of the barrier Potomac, there were on the line no more than 4,000 frightened home guardsmen and militiamen.

Paroxysms of hysteria in the city

Reinforcements were on the way, to be sure. As soon as he realized what Early was up to, Grant dispatched two veteran VI Corps divisions—11,000 strong—and diverted to Washington 6,000 men of XIX Corps. The transports were not far downstream from the city, Lincoln knew, but Jubal Early had arrived. His 4,000 cavalry and artillerymen were harassing the Federal line for miles in either direction; he had 10,000 infantrymen and 40 cannon, and his skirmishers were already chasing the Federal pickets back into the fortifications.

Confronted by what they had so long feared—actual danger—the civilians of Washington went into paroxysms of hysteria, telling each other that a Confederate army "50,000 strong" was laying waste to Maryland and Pennsylvania. Military and political functionaries, meanwhile, went berserk.

Everyone took charge of everything. The military department was commanded by Maj. Gen. Christopher Augur; but the Army Chief of Staff, Henry Halleck, ordered Maj. Gen. Quincy Gillmore to take charge in the emergency; but the Secretary of War, Edwin Stanton, had called in Maj. Gen. Alexander McCook to handle the crisis; but General in Chief Grant had sent Maj. Gen. E.O.C. Ord to save the situation.

When yet another general, who for some reason was relaxing in a New York City hotel, sent word that he would be available for duties commensurate with his

For the moment the prize was out of Early's reach—
the problem not a lack of courage but simple fatigue.

rank, Chief of Staff Halleck blew up. "We have five times as many generals here as we want," he responded, "but are greatly in need of privates. Anyone volunteering in *that* capacity will be thankfully received."

Everyone thought of something. Halleck had the hospitals checked for potentially useful walking wounded, so they could be formed up and marched toward the fortifications. On the way they probably stumbled into a ragged formation of clerks from the offices of the Quartermaster General, Brig. Gen. Montgomery Meigs, who had decided that now was the time for them to exchange their pencils for rifles. Someone else made preparations for destroying the bridges over the Potomac River. A steamboat was fired up and held ready to get the President away.

A restless tattoo of musketry

But the President was singularly serene. "Let us be vigilant," he telegraphed to an overwrought Baltimore committee, "but keep cool. I hope neither Baltimore nor Washington will be sacked." Yet on that sultry afternoon, with the earth trembling to the bark of the big guns, with the acrid smell of black powder hanging in the stifling air and a restless tattoo of musketry sounding along the lines, keeping cool could not have been easy.

Both the Federal defenses and the Confederate threat looked stronger than they were. "Undoubtedly we could have marched into Washington," wrote one of Early's division commanders, Maj. Gen. John B. Gordon. "I myself rode to a point on those breastworks at which there was no force whatsoever. The unprotected space was broad enough for the easy passage of Early's army without resistance."

Just beyond this inviting gap lay the legislative and administrative heart of the enemy government. What is more, there was the Federal Navy yard, with its ships to burn; the United States Treasury with its millions of dollars in bonds and currency, the seizure of which would have had catastrophic effects on the Northern economy; warehouse after warehouse of medical supplies, food, military equipment, ammunition—all scarce and desperately needed in the Confederacy. In short, a rich city, virgin to war, awaiting plunder.

Not to mention the incalculable humiliation to the Union if such a rape of its capital occurred. Maj. Gen. Lew Wallace (later the author of *Ben Hur*) had been stiffened to make his desperate stand against Early on the Monocacy, he wrote afterward, by a vision of "President Lincoln, cloaked and hooded, stealing from the back door of the White House just as some gray-garbed Confederate brigadier burst in the front door."

But for the moment, at least, the enormous prize was out of reach. The problem was not a lack of will or courage or even firepower; the problem was something that civilians and historians rarely think of as part of war—simple fatigue. Early's foot soldiers were just too tired to walk that far.

In Blair's mansion in Silver Spring, Early's staff joked about escorting Breckinridge back to the Senate.

During the hottest and driest summer anyone could remember they had marched about 250 miles from Lynchburg in three weeks. They had fought hard at the Monocacy on July 9, then after burying their dead had marched again at dawn, struggling 30 miles in the searing heat to bivouac near Rockville, Maryland. The night of the 10th brought so little relief from the heat that the exhausted men were unable to sleep. On the 11th, with the sun burning more fiercely than ever, they had begun to give out.

General Early rode along the loosening formations, telling staggering, sweating, dust-begrimed men that he would take them into Washington that day. They tried to raise the old Rebel Yell to show him they were willing, but it came out cracked and thin. The mounted

Thomas A. Lewis' second book on the valley campaign of 1864, The Guns of Cedar Creek, *published by Harper & Row, is out this month.*

They raided Blair's wine cellar, enjoyed a convivial dinner, then waited to attack at dawn's first light.

officers reluctantly slowed their pace, but before midday the road behind the army was littered with prostrate men who could go no farther.

Thus when Early ordered General Rodes to attack, both men—on horseback—were far ahead of the plodding columns. While Early fumed and spat tobacco juice, his officers struggled to get men and guns in position. They managed to mount a skirmish line to chase in the Federal pickets, but putting together a massed line of battle was beyond them. The afternoon wore on, and to Early every hour was the equivalent of a thousand casualties.

It was not the fault of his men. General Gordon later wrote of them that they possessed "a spirit which nothing could break."

Nor was it a failure of the officers; Jubal Early had for subordinate commanders some of the best generals in the Confederacy. John Gordon and John Breckinridge were, like Early, lawyers and politicians who lacked his West Point training but had shown a remarkable ability to lead men in combat. Breckinridge was a former Vice President of the United States and a candidate for President in 1860, who came in second to Lincoln in the electoral vote; now he was second in command of an army advancing on the U.S. capital. Stephen Dodson Ramseur, a major general at 27, possessed a ferocity in battle that usually got results.

No one embodied more of the paradoxes of this war than John Breckinridge. A passionate and lifelong champion of the Union and the Constitution, he had been convinced for years that slavery could not and should not survive; but he also believed that it was unconstitutional for the national government to prohibit slave states from participating in the country's booming Western expansion—the settlement of the territories.

For his constitutional arguments he was ostracized in the Senate and described as a traitor to the United States; back in Kentucky he pleaded with his state to stay out of the spreading civil war. Union military authorities ordered his arrest. Thus John Breckinridge had been left with nowhere to go but into the armies marching against the Union, on behalf of slavery.

Such were the men who stood at Jubal Early's side that afternoon. Before he could form his gasping troops and launch his attack, Early saw "a cloud of dust in the rear of the works toward Washington, and soon a column of the enemy filed into them on the right and left, and skirmishers were thrown out in front." Artillery fire opened from a number of batteries.

The Confederates had managed to take a few prisoners, who freely admitted that their lines were being held by "counter jumpers, hospital rats and stragglers." But the men just arriving were veterans, perhaps reinforcements from Grant. Jubal Early was bold, but he was not foolhardy; however tempting the prize, he would not commit to battle without knowing what he was facing. As he wrote later, "It became necessary to reconnoiter."

The Federal regiment that had impressed Early was from Grant's Army of the Potomac, but it was alone. Meanwhile, however, Abraham Lincoln had spotted something really interesting in his spyglass, and driven eagerly south to the Sixth Street wharves.

Marching off in the wrong direction

He arrived in midafternoon, and stood quietly gnawing on a chunk of hardtack while Maj. Gen. Horatio Wright assembled the first 650 arrivals from VI Corps and marched them off—in the wrong direction—toward Georgetown. With great shouting and clatter, some staff officers got the men turned around and headed up 11th Street, toward the enemy.

A Vermonter named Aldace Walker marched with VI Corps that day. He thought it was still morning, and had his dates confused, but he remembered how the presence of the capable Old Sixth brought "intense relief to the constitutionally timid Washingtonians. . . .

Lincoln stood on the parapet, his top-hatted form an inviting target for Confederate sharpshooters.

Citizens ran through the lines with buckets of ice-water, for the morning was sultry; newspapers and eatables were handed into the column, and our welcome had a heartiness that showed how intense had been the fear."

The official welcome was less clear-cut. To his disgust, Wright was ordered to hold his men in reserve, even though the raw troops at Fort Stevens were being severely pummeled by Early's guns and skirmishers, and were already showing signs of caving in. In the end, the only thing the soldiers did that night (and this only because Wright insisted on it) was to move out in front of the fortifications to restore a picket line and push back enemy skirmishers. "The pseudo-soldiers who filled the trenches around the fort were astounded at the temerity displayed by these war-torn veterans in going out before the breastworks," Walker remembered scornfully, "and benevolently volunteered most earnest words of caution."

Apparently the Federal high command did little that night but further confuse each other. Charles Dana, an Assistant Secretary of War and an old friend of Grant's, sent a despairing wire to the commanding general Tuesday morning: "General Halleck will not give orders except as he receives them; the President will give none, and until you direct positively and explicitly what is to be done, everything will go on in the deplorable and fatal way in which it has gone on for the past week."

On Monday night, Early and his division commanders gathered at their captured headquarters, "Silver Spring," the imposing mansion of the prominent Washington publisher and politician Francis Preston Blair (a cousin and former political patron of John Breckinridge). There the Confederate officers had dinner, a council of war and a party. Men were still straggling in from their hellish march, and it seemed a precious opportunity had been lost the previous afternoon. But the Federal works were still not manned in strength, and Early ordered an assault at first light.

A sound of revelry by night

His officers raided Francis Blair's wine cellar and talked about what they would do next day. They joked about escorting John Breckinridge back to his former place as presiding officer of the Senate. Outside, soldiers speculated about how they would divide up the contents of the Treasury. According to General Gordon, one private was asked what they would do when they took the city, and said the situation reminded him of a family slave whose dog chased every train that came by. The old man wasn't worried about losing his dog, said the soldier, he was worried about what the dog was going to do with a train when he caught one.

When reinforced Federal forces attacked after an artillery barrage, Rebel veterans opened a fire so hot that the attack instantly stopped. Even so, the door to Jubal Early's niche in history slammed shut.

It was all good fun, but soon daylight was coming.

General Early was up before dawn, surveying the Federal fortifications with his field glasses. The trenches and the parapets teemed with blue uniforms—not the dark, new blue of fresh, untested cloth, but the faded sky-blue of well-used material. Everywhere he saw fluttering battle flags bearing the Greek Cross of VI Corps. The door to Jubal Early's niche in history had just slammed shut.

"I had, therefore, reluctantly to give up all hopes of capturing Washington, after I had arrived in sight of the dome of the Capitol," he wrote. But they could not give any sign of flinching with that many soldiers ready to pour after them. They would stay in place, look as dangerous as they knew how, and as soon as darkness covered them head back to Virginia. The Federals, meanwhile, made ready to fight a climactic battle for the city. They did it in the time-honored Washington way—with endless meetings. The day wore on, the baking heat returned, the sharpshooters let fly at anything that stirred, the cannon boomed from time to time—and nobody moved.

The citizens of Washington regained their courage. Ladies and gentlemen of society and rank declared a holiday and swarmed out to picnic and cheer the intrepid defenders. Some perhaps had been among the picnickers who, three years before, had gone to cheer the boys going into battle at Bull Run, but if they remembered the bloody stampede that had engulfed the tourists on that day, they gave no sign.

At midafternoon they were joined by the President and Mrs. Lincoln, who arrived at Fort Stevens in a carriage. General Wright went out to greet the Commander in Chief and casually asked if he would like to see the fight; the various chieftains had at last agreed to try a reconnaissance in force, to press the Confederates

back and see just how strong they were. General Wright intended his question to be purely rhetorical, but as he wrote later, "A moment after, I would have given much to have recalled my words."

Delighted at the prospect of seeing actual combat for the first time, Lincoln bounded up to the parapet and stood looking over the field, his familiar, top-hatted form an inviting target for Confederate sharpshooters. While Wright begged the President to take cover, a trooper in Lincoln's cavalry escort saw bullets "sending little spurts and puffs of dust as they thudded into the embankment on which he stood." Thus for the first and only time in history a President of the United States came under fire in combat.

Behind the breastworks, a busy young captain from Massachusetts named Oliver Wendell Holmes jr. glanced up, saw a tall, awkward civilian standing in the spray of bullets and snapped, "Get down, you damn fool, before you get shot." Only then did the future Supreme Court Justice realize that he was berating the President.

Meanwhile a VI Corps brigade, about 2,000 strong, was sneaking out of Fort Stevens and taking position in a wooded area 300 yards east of what is now Wisconsin Avenue, just behind the line of Federal skirmishers and out of sight of the enemy. Their orders were to make a surprise charge at the Confederate positions on the wooded ridge less than a mile from Fort Stevens, where the Walter Reed hospital now stands.

Lincoln watched these maneuvers intently, standing fully exposed on top of the parapet, oblivious to the leaden hail. General Wright stood at the President's side, along with C.C.V. Crawford, the surgeon of one of the attacking regiments. Suddenly, a round ricocheted off a nearby soldier's rifle and into Crawford's thigh. Gravely wounded, he was carried to the rear.

General Wright, beside himself, ordered everyone off the parapet, and when the President ignored him threatened to have a squad of soldiers forcibly remove Lincoln from danger. "The absurdity of the idea of sending off the President under guard seemed to amuse him," Wright recalled, and more to put an end to the fuss than anything else, Lincoln finally agreed to sit behind the parapet and thus place most of his frame behind cover. But he kept leaping to his feet to see what was happening.

When the attacking regiments were in position, the guns of Fort Stevens opened a sustained fire on the enemy positions. The 36th shot, fired at about 6 P.M., was the signal for the picket line to plunge forward. Behind it, appearing as if from nowhere, surged thousands of howling Federals.

"I thought we were 'gone up,'" one of Early's staff officers remembered. But these were men familiar with death, and they opened a fire so hot that the Federals came to a halt and sent for reserves. The enemy, the Federal division commander reported, "was found to be much stronger than had been supposed."

There was cheering from the spectators and joking in the rear echelons, but this was no game; Aldace Walker remembered it as a "bitter little contest." Every regimental commander in the leading Federal brigade was shot down; a hundred Confederate dead were later found lying on the field between Fort Stevens and the Blair house. Heavy fighting continued until 10 P.M., even though General Wright ordered his men to hold their ground but not to storm the Confederate lines.

Major Douglas found Jubal Early in Francis Blair's mansion after dark, getting ready to pull out. "He seemed in a droll humor, perhaps one of relief," Douglas recalled, "for he said to me in his falsetto drawl: 'Major, we haven't taken Washington, but we've scared Abe Lincoln like hell!'" And so with hollow laughs they began a long retreat, away from legend and glory, into Virginia, where Appomattox waited.

A half-mile north of the crumbling remains of Fort Stevens, the asphalt and concrete environs of Georgia Avenue are interrupted by another unremarkable, postage-stamp square of green. Hardly larger than a townhouse lot, it is a National Cemetery, wherein are buried a few of the men for whom this "bitter little contest" was the last. Some earnest monuments to the men of New York and Ohio are crowded together here, but the most imposing thing one sees on entering is a bronze plaque. It memorializes not the dead, but an 1875 order prohibiting picnicking on, and otherwise defacing, their graves. Forgetfulness came quickly.

North of Fort Stevens in a tiny cemetery, a statue and a plaque mark a bare handful of Yankee graves.

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The right choice.

By Jim Doherty

Voyaging in the boundary waters: Ah, wilderness!

First, you paddle. Next, you portage. Then you paddle and portage some more. It can be hard on the body but it's balm for the soul

On a chilly morning, canoeists pause in midstroke to watch the mist rise from the glassy surface of a lake.

Recently my longtime camping partner and I got the bug again. The symptoms were unmistakable: restlessness, preoccupation, a craving for solitude. There was only one cure for it. A few weeks later we set off on a canoe trip through the primitive lake country that sprawls for miles along the Minnesota-Ontario border. We paddled between dreamy islands, floated past thundering waterfalls and glided over sunken boulders the size of houses. We gaped at eagles, otters and deer, followed fresh moose tracks through the fragrant woods and hauled several world-class pike out of the stony depths. We packed our gear across portages the Indians and voyageurs used centuries ago; we built our campfires on granite headlands that were old when the Earth was young. As the days slipped by and we pressed deeper into the wilds, we could feel the cure working its magic on our souls.

We could feel a lot of other things, too—things like mosquitoes, driving rain and bone-chilling cold. We felt frustrated when we got lost (not an infrequent occurrence) and we felt angry when we bickered over which trail to take, what to eat or whose turn it was to sit in the back of the canoe. There were times, after hours of tough paddling, when our arms felt like they were about to drop off and our butts felt as if they were encased in cement. Several nights we were alerted by ominous thrashings outside the tent and lay awake for hours, expecting at any moment to hear a bear rip open our food pack. What we felt then, I think, was fear.

Canoeing in the boundary waters is not everyone's idea of a grand vacation; many would consider it, on the contrary, an ordeal. Actually, it's a bit of both. Every trip has its low points but what you remember, as each journey draws to a close, are the highs. Even the things you worry about represent a welcome change from the complexities of modern life. We're dealing here with the basics: keeping dry and warm, making camp, catching fish, sleeping, moving on.

If we had wanted to associate our little junket with

There are only two ways to get through the border country of Minnesota and Ontario—on paths or across water. The wilderness appears almost as pristine today as it was when voyageurs canoed it 200 years ago.

an auspicious event or occasion, there were several to choose from. I was closing in on my 50th birthday, my wife Sandy and I would soon commence our 30th year of matrimony and this summer the Boundary Waters Canoe Area Wilderness (BWCA), as the American part of the region is known, begins its 25th year as a charter member of the National Wilderness Preservation System. Commemoration, however, was not what we had in mind. Getting away from it all was what we had in mind and the boundary waters comprise what is probably the most accessible true wilderness in the lower 48.

The term "boundary waters" refers to the intricate tangle of paths, lakes and rivers occupying the southern edge of the Canadian Shield, a Precambrian formation that underlies central and eastern Canada and parts of the upper Midwest and New York. This rugged landscape contains some of the Earth's most ancient rock. More than three billion years ago it was

Glenbow Museum, Calgary

Voyageurs paddle through fog on Lake Superior in 1869 painting by English artist Frances Anne Hopkins.

an embryonic crust immersed in the primordial sea, wracked by quakes and convulsed by eruptions. After the volcanic lava flows solidified, they were intruded, uplifted and eroded. With the coming of the ice age, the topography was tortured yet again, this time by a series of glaciers, the last of which receded only about 12,000 years ago, leaving the country looking pretty much as it does today: scoured, pitted, shattered and brimming with water.

A little over a million acres of this austere and lonely land are contained within the BWCA. The BWCA itself runs for approximately 120 miles along the top of the Superior National Forest from a point near the Grand Portage State Forest on Lake Superior to Voyageur National Park in the west. Complementing it on the Canadian side is Ontario's 1.15-million-acre Quetico Provincial Park, a narrower but deeper preserve (see map, opposite).

The Superior National Forest and the Quetico Forest Reserve were both established in 1909 at a time of rising public concern in Canada and the United States about watershed protection and other conservation issues. Quetico became a park four years later but the BWCA did not officially become part of a federal wilderness system until 1964. That's when Congress passed the Wilderness Act, a tremendously controversial piece of legislation, more than a decade in the making, that marked the first time this nation (or any other nation, for that matter) set aside a comprehensive network of lands primarily for the purpose of perpetuating wild places. By now, more than 450 protected areas adding up to some 90 million acres have been designated in 44 states. They range from the U.S. Fish and Wildlife Service's 8-million-acre Arctic National Wildlife Refuge in Alaska to the Bureau of Land Management's 84,700-acre Paiute Wilderness in Arizona to the National Park Service's 1,363-acre stretch of Fire Island National Seashore near New York City.

The Wilderness Act stipulated that such areas must be "untrammeled" by man, or give the appearance of being untrammeled, but the BWCA did not meet either standard. The boundary waters region has been trapped, logged and otherwise trammeled by a variety of enterprising parties, including prospectors, surveyors, resort owners and commercial fishermen. Yet today, after undergoing what amounts to a metamorphosis in reverse, it looks and feels almost as pristine as it was when the fur traders began moving their brigades of canoes through it in the mid-1700s. Private holdings have been bought up; resorts and cabins have been moved out or destroyed. Mining, logging and other commercial activities are banned; so are snowmobiles, chain saws and other machines. Airplanes and outboard motors are restricted, and blight-resistant white pine trees are being replanted where virgin stands once rose against the horizon.

The BWCA's restoration is the endgame of a political chess match that began in the early part of this century. From the start, conservationists and their

Broken line retracing part of old voyageurs' "highway" is now the boundary between the U.S. and Canada.

Hopkins joined her husband, a Hudson's Bay Company official, on several inspection trips in the wilderness.

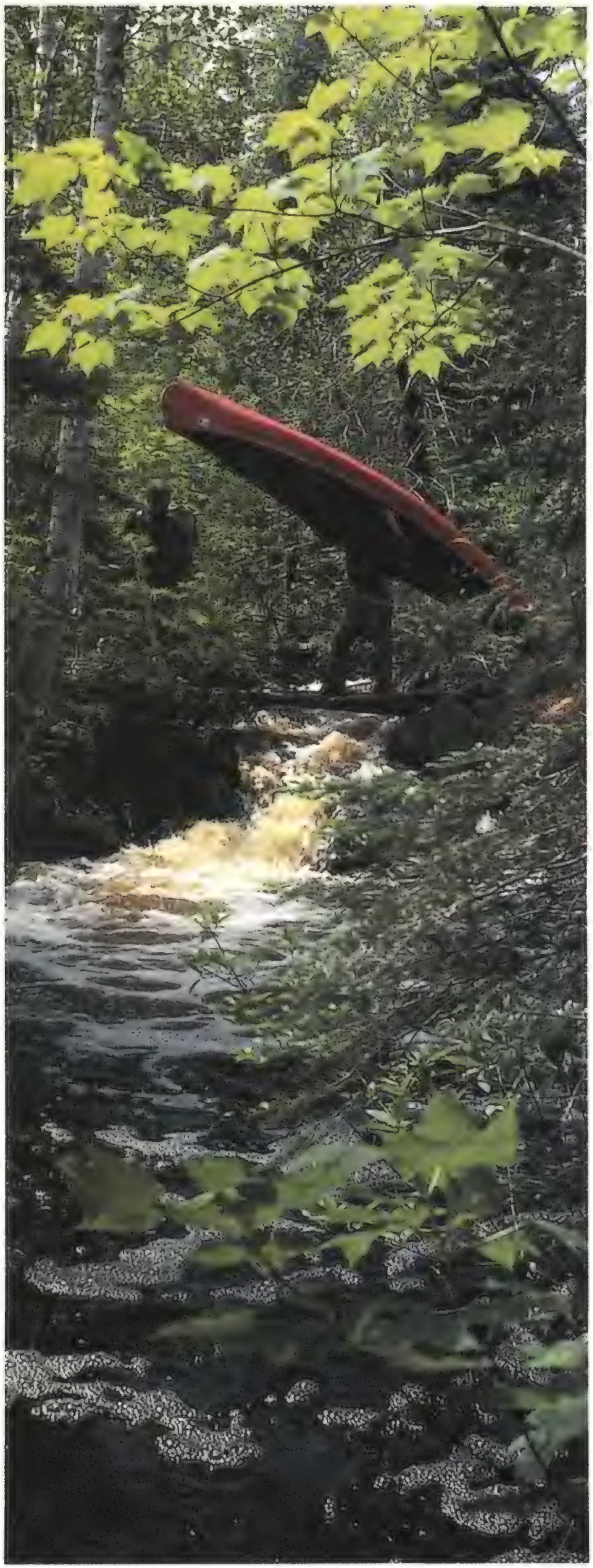
political allies wanted Uncle Sam to preserve the primeval character of Quetico-Superior, as the region was then called. "Here was a type of American landscape as magnificent in its own way as the Grand Canyon or Yosemite," enthused a young U.S. Forest Service recreational land planner named Arthur Carhart after canoeing through it in 1919. "Nothing that man-made 'development' might do would enhance it." Carhart convinced his boss to scrap plans for building roads in the area. A battle over protection of Quetico-Superior raged in Minnesota and Washington, D.C. for almost 40 years. In the end, the prowilderness forces prevailed.

Now that the BWCA is off limits to those whom preservationists consider the enemy, it's in danger of being overrun by its friends. Partly because of its accessibility, partly because recreational canoeing has exploded in recent years, it has become one of the busiest wilderness areas in the country. In 1987, visitation was up 10 percent, to 180,000, and there are times when this traffic creates problems you don't expect to find in a wilderness. Portages get congested. The scattered campsites start filling up by midafternoon. Along the lakes closest to the most heavily used entrance points, many sites take a terrific pounding. I visited several of them not long ago with Chip Elkins, a friendly, soft-spoken man who works as a ranger for the Forest Service. The first one was in pretty good shape. A work crew had planted some grass and trees there, and blocked off part of the eroding shoreline with logs. The next one didn't look so hot. It had been closed to rest up for a while but people were camping and building fires there anyway, and the bark had been stripped off several birch trees. The third place was much worse. Somebody had recently chopped down dozens of live pine trees with an ax. It looked like a small tornado had blasted through the area.

Having been in the BWCA before, Sandy and I knew we could avoid such scenes by eschewing the easier canoe routes and working our way into more remote areas. This time we decided to cut across the BWCA and head up into Quetico which, because of Ontario's tough quota restrictions, is visited by only a tenth as many people.

Our point of departure was the town of Ely, which is located inside Superior National Forest about 120 miles due north of Duluth. Ely is not your typical North-country tourist trap. It's a gritty little place

Jim Doherty, a member of the Board of Editors, wrote about beekeeping in the July 1987 issue.



Portaging between lakes, canoe carrier crosses stream while partner leads the way with paddles and pack.

where (with apologies to Garrison Keillor and Lake Wobegon) some of the men are strong, some of the women are good-looking and the rest don't much give a damn. Among the establishments to be found in the several blocks that constitute the commercial district are a handful of liquor stores and saloons, 14 outfitters and fishing-tackle shops, a half-dozen motels, Zup's supermarket and the IGA, and the Yugoslav National Home. There are no trendy boutiques, no Alpine villages hawking souvenirs, fudge and T-shirts; there is only one semi-cute eatery, a rustic sandwich shop called the Chocolate Moose. Slide behind the counter at Britton's, a more traditional café, and you may find yourself passing the time of day with a wilderness guide, a champion dogsled racer, a black bear researcher or an ex-miner.

Ely used to be a thriving center of iron mining and resorts. Like many other communities in northeastern Minnesota, it fell on hard times after the rich reserves of high-grade iron ore in and around the Mesabi Range began to play out and, later, domestic steel producers ran into stiff competition from abroad. The tourist economy suffered a severe jolt a decade ago when the boundaries of the BWCA were expanded, snowmobiles and outboard motors were declared non grata and the Forest Service's resort buyout program entered a new phase. In the past few years, the population has dropped from more than 5,000 to around 3,800. If the canoe is king in Ely nowadays, it's not entirely a matter of local choice; outfitting paddlers is just about the only game left in town.

After securing our provisions and camping gear at one of the emporiums on Sheridan Street, we drove east out of Ely to the Forest Service's Moose Lake access point. We hitched a motorboat ride from there up to Prairie Portage, where an entire network of westward-flowing rivers and lakes converges on a narrow *détroit*, or channel, and transforms itself into a frothy cataract that explodes into Basswood Lake with a deafening roar. Since that's not an ideal place to put a canoe, we portaged around it.

How to stuff a canoe

The next order of business was figuring out how to stuff ourselves and our gear into our new canoe. After several false starts, we discovered that the three biggest packs (one for food, one for sleeping bags and tent, one for pots, pans, clothing) would fit in the middle; we lodged the smaller backpack behind the aft seat, and the fishing rods and extra paddle slid in along the sides. That done, Sandy nimbly clambered across the baggage to the front seat and we were on our way.

At first we headed west into the wind across Basswood Lake, following the historic voyageurs' "highway." It's

A tent occupies a typical site in the boundary waters, an isolated point encircled by rocks and protected by cedar, birch and pine trees. Ledgerock (left) provides easy access to water, which is clear, dark and, in many areas, pure enough to drink, though treatment is wise.

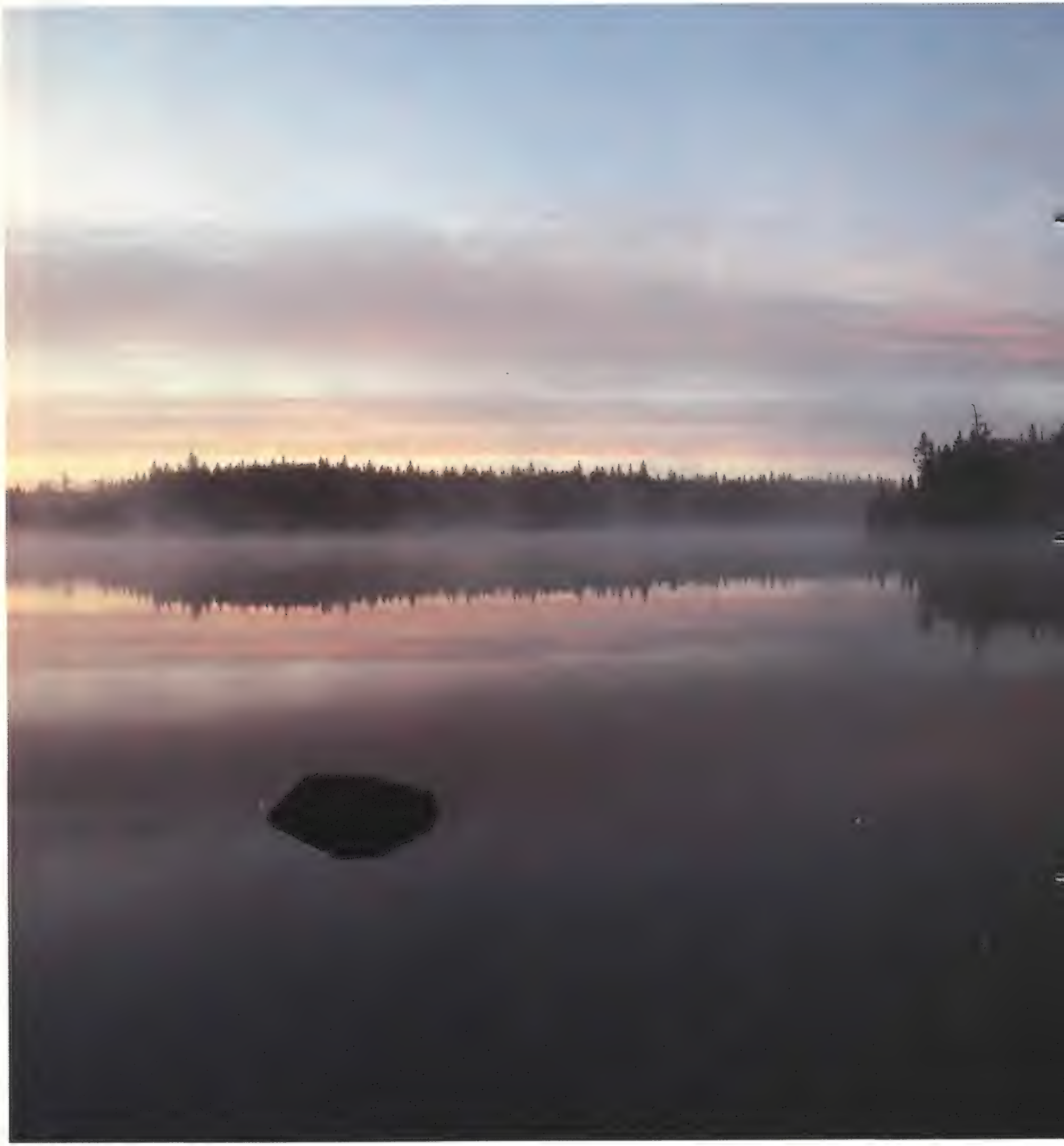
an enormous body of water, Basswood—Z-shaped and about 25 miles long. Going through Inlet Bay and passing Green Island, we stuck close to shore; then we were swallowed up in the openness of Bayley Bay. Bending north there, we caught the full force of the wind on the port side of the canoe and after that we had to fight for every foot of headway. We paddled without letup but no matter how hard we worked the distant shore remained almost stationary.

By the time we reached the first Quetico portage, our initial exuberance had been replaced by a sort of rueful resignation. As we loaded up for the first leg of the portage (we had to make two trips at each carry), we grinned at each other as if to say: well, you *asked* for it. Sandy staggered off with one big pack and the paddles. I followed with the canoe and the backpack. It had been more than a year since I'd had to contend with the tormenting device known as a canoe yoke. That's the padded strut used to support the overturned hull on the muscles between your shoulders and neck. Luckily, the portage was a relatively short one—less than 500 yards.

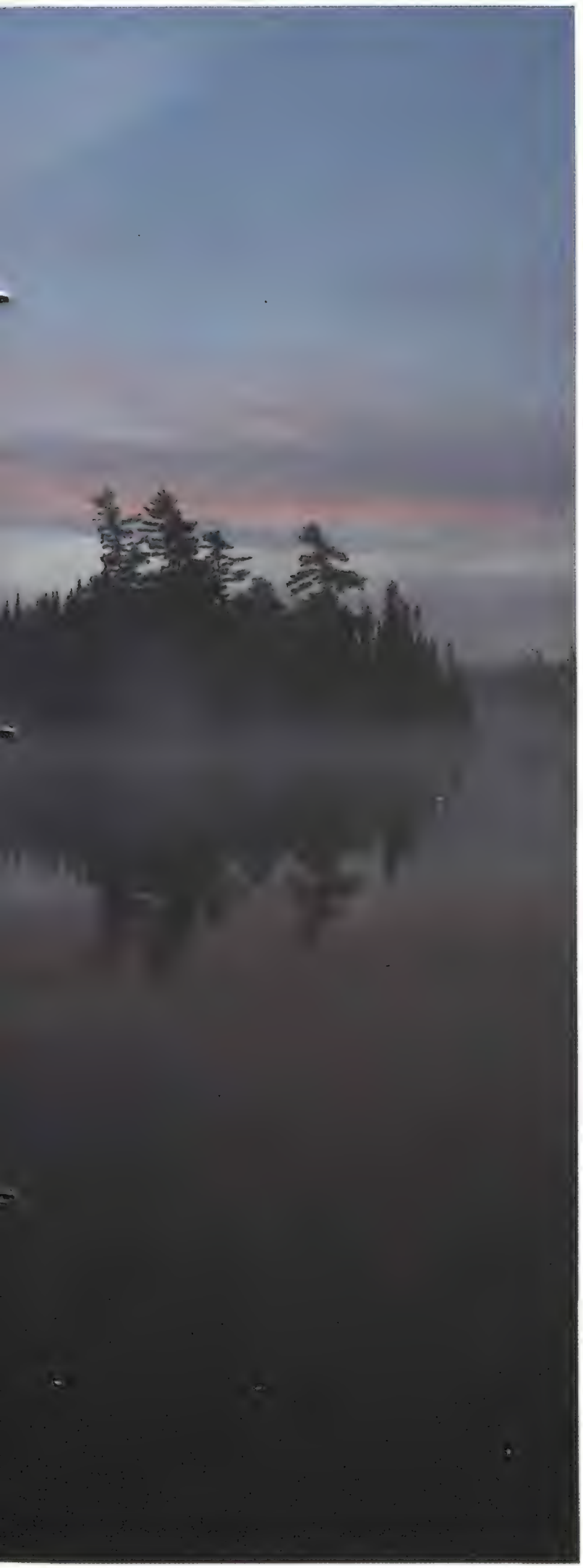
Canoeing and portaging are two sides of the boundary waters triangle; the other side consists of the land and everything else. About the technique of canoeing a great deal has been said, much of which it is not necessary to know. It takes some skill to get a canoe through white water without wrapping it around a rock or capsizing, but there is nothing mysterious about propelling yourself across a lake or quiet river. I've been canoeing nearly all of my life and I wouldn't know a J-stroke if someone hit me between the eyes with one.

The first thing you do when you get into a canoe is try to make yourself comfortable—kneel, sit, half-sit, whatever. It doesn't matter because any position you assume will become unbearable in several minutes and you will have to change it. That is in the nature of long-distance canoeing. The next thing you do is reach forward with your paddle, put it into the water, pull it back and take it out. You do that over and over again until you get where you're going or can't do it anymore. Your partner does the same thing on the opposite side of the canoe (unless you prefer to go around in a circle) and every once in a while you change sides. That's about all there is to it. Eventually you will discover ways to increase your efficiency but basically paddling

As a new day dawns, the wild world comes to life



Still water mirrors shorelines at sunrise. A variety of species thrive in the deceptively tranquil region.



An iris delights passers-by.

A solitary timber wolf howls in the woods.

Merganser family travels in single file.

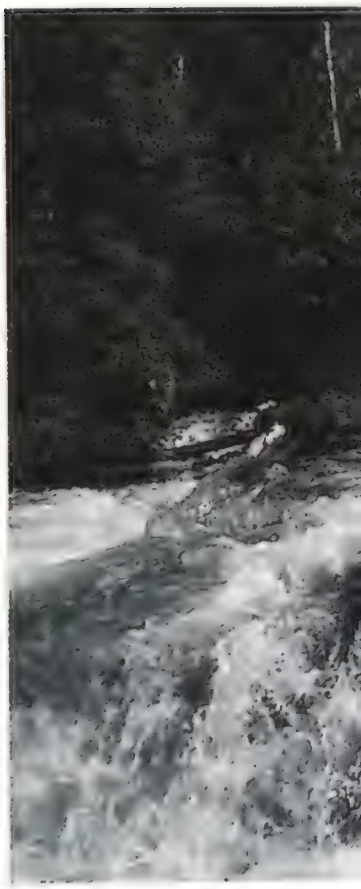
Squirrel nibbles pinecone.

Gnarled cedar's bark shows its age.

Mosquito alights on calypso orchid.

Bear cub peers through buttercups.

Surprised, a moose shakes its head.

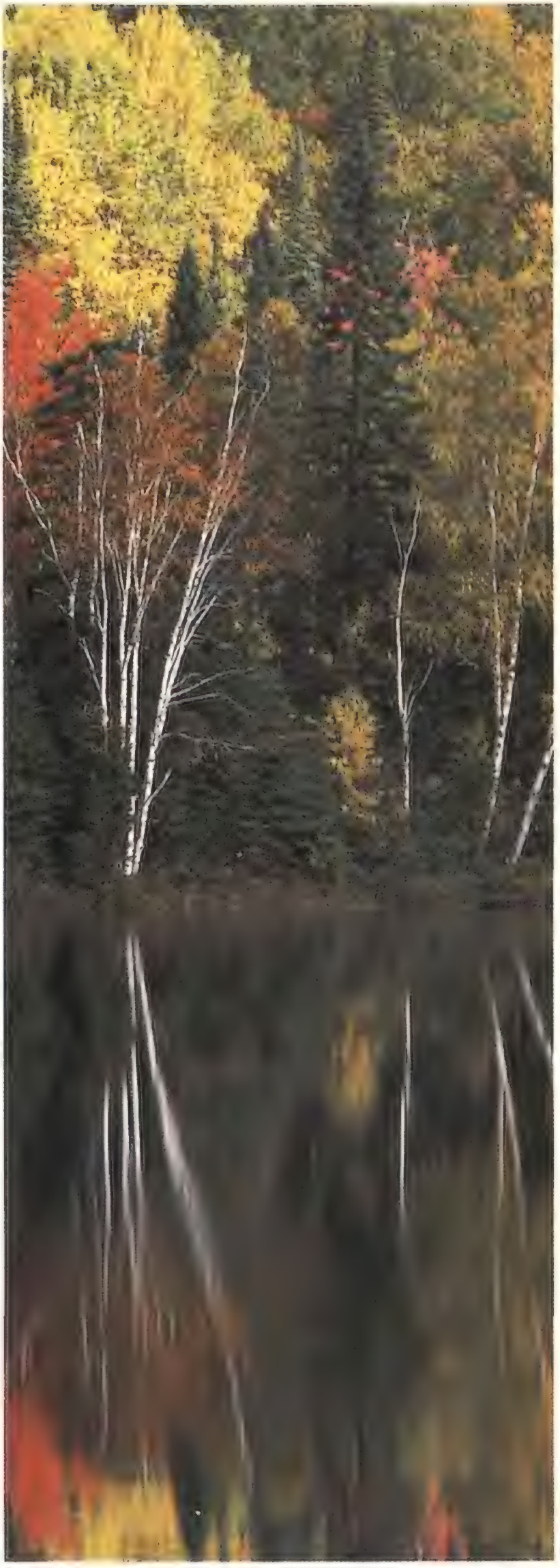


Bunched up near access point, canoes will eventually go their own ways through intricate chains of lakes.

A common loon meanders across a quiet bay. Boundary waters would not be the same without calls of loons.

Brawling rapids at Prairie Portage mark spot where entire system of waterways spills into Basswood Lake.

A shattered rock outcropping testifies to the power of glaciers that gave the area its rough-hewn look.



Birch trees stand out on the autumnal lakeshore but their reflections are blurred by a gentle breeze.

Coals match the sunset at rocky campsite. Fire grates designate all sites in the BWCA but not in Quetico.

is pretty much like anything else that's associated with wilderness tripping: any fool can do it and the more you do it the better you get.

There are a couple of differences between paddling in the front and paddling in the back. The front person has to work a little harder, the back person has to steer. You work harder in the bow because you're paddling into the curve of the canoe and therefore must pull around it. The person in the rear draws his paddle straight back along the taper of the canoe, which is easier. Sometimes the stern paddler keeps the canoe on course by finishing off a stroke with a circular motion. Sometimes he feathers the paddle and uses it as a rudder, missing a beat or two while the other person keeps on stroking. This enables the steerer to sneak a rest now and then. The other advantage of sitting in the back is that the bowperson can't see what you're doing. I usually insist on occupying the stern seat on long trips because Sandy excels at setting a steady and tireless pace whereas I'm more adroit at handling the craft and reading maps. The fact that I could cheat a little bit back there, if I wanted to, has absolutely nothing to do with it.

The "challenge" of carrying a canoe

The flip side of this is that it's my job to carry the canoe on portages. The less said about portages the better. They are to canoeing what having a tooth pulled is to eating. The typical portage trail is several hundred yards long, though many are over a thousand. It is either rocky, slippery and uphill, or muddy, slippery and uphill. No portage trail in my experience goes downhill except those that resemble the Grand Canyon or are so studded with sharp rocks that descending them without a fall is nearly impossible. Some big talkers profess to enjoy the "challenge" of the portage but that is a lot of macho nonsense no mature woodsman would embrace. The fact remains that portages are part of the price you must pay to reach your destination.

Hauling a 40- or 50-pound pack and assorted other gear is bad enough. Carrying a 55- or 60-pound canoe on your shoulders is worse. It's awkward and painful. You can't see where you're going. Since it's more trouble to put the damned thing down, rest and pick it up again than it is to grit your teeth and keep going, you trot along as best you can, praying for the sound of water up ahead. Anyone who spends much time running through the woods with a boat over his or her head is courting disaster. I rammed into a tree one afternoon and ended up sprawled in the mud with the canoe resting beside me. "Don't worry, Mark Trail," said my partner, who was bringing up the rear. "I won't tell anyone."

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Towboats ferry canoeists, gear up Moose Lake. In most of the boundary waters, motorboats are banned.

You're on your own in the boundary waters, and accidents do happen. People drown, fall off cliffs, suffer heart attacks. Not long ago, two campers were killed in their tent when lightning struck a nearby tree. Appalling hardships were routinely documented by travelers in earlier times—sickness, gunshot wounds, broken bones, gashes. When a voyageur on an 1823 expedition from Lake Superior to Lake of the Woods was seized with an agonizing "inflammation of the bowels," he was left by his comrades in the care of an Indian family, who warned that he would have to be content with family fare. "I was not a little disturbed," the expedition leader noted in his log, "by seeing two men and a woman, at the entrance of the wigwam, feeding with their fingers, out of a tub, the unwashed entrails of a rabbit, and wiping their hands, when they had done, on their own heads or on the back of a dog."

When people think of the Northern woods, one of the first things that usually come to mind is Paul Bunyan, the mythical lumberjack. The real heroes of the region, however, were the redoubtable little French-Canadian canoemen who hauled the freight for explorers and fur traders in the 18th and 19th centuries. They were with Pierre Vérendrye when he founded a number of trading posts in the boundary waters and beyond in the 1730s and '40s. They were with Vérendrye's eldest son when he and 20 companions were beheaded by a party of Sioux raiders on an island in Lake of the Woods. They accompanied Alexander Mackenzie of the North West Company when he journeyed across Canada to the Pacific Ocean a decade before the Lewis and Clark expedition made it on the American side. Later, they were the sinew and bone of the Hudson's Bay Company, carrying and paddling its enormous birch-bark canoes along the punishing trade route that extended for 3,000 miles between Montreal and Lake Athabasca via Grand Portage. No portage was too formidable for the voyageurs, no rapids too savage, no weather too inclement until their waterways were locked in ice.

An astonishing capacity for work

To anyone who has sampled a mere sliver of the voyageurs' highway, their vigor, fortitude and strength are beyond comprehension. They trotted along portages of up to 12 miles, carrying two and sometimes three 90-pound bundles each. They paddled as many as 18 hours a day, pausing every hour or so to smoke a pipe and then resuming their hectic pace—singing all the while, mind you, to set the rhythm and pass the time. They slept on the bare ledgerock, subsisted on a diet of pea soup or cornmeal mush and a little pork, and lived in fear only of the day when they would be too old to paddle anymore. Their pugnacious pride in their manhood and their work was, by all accounts, an astonishing thing to behold.

The voyageurs loved the wilderness. When the European demand for furs ebbed in the late 1800s, their era was at an end and, in one way, at least, it was a good thing. At about that same time, the demand for lumber in the New World was skyrocketing. If the canoemen had lived to see the havoc Paul Bunyan's legions wreaked upon the Northland, it surely would have broken their hearts.

A long time ago, when I was quite young and civilization had begun to press in on my grandparents' cabin in northern Wisconsin, I wondered if the bald eagles would still nest on our lake after the shoreline filled up, and whether the wolves would stick around. I asked about that one day and Gram thought for a long moment before she said: "Yes, well, it will always be wild up North." I didn't believe her. When, years later, I discovered the boundary waters, I realized she had been right after all.

Forester Clifford Ahlgren and his wife, Isabelle, a botanist, arrived at the same conclusion from a different direction. Whereas I saw the wildness diminish in our neck of the woods, they were part of the sometimes painful process that brought it back to theirs. For years, the Ahlgrens studied the ecology of the boundary waters at a private research station on Basswood Lake, where they raised their two children, Molly and Larry. In the late 1970s, the complex was removed to comply with new regulations. One day, the family re-

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turned to the empty site. While the parents wandered among the stands of pine trees they had planted there, the youngsters went back to their favorite hangout, a special place on the granite shoreline they had named "the fairyland." "Everything is gone now," said Molly. "This isn't," said Larry. "The buildings are gone but the *land* is still here."

That's the third side of the triangle: the land. For those of us who can't live without the Northern wilderness, for our children and our children's children, this particular fairyland will always be there, always be wild, always be calling to us. Sigurd Olson, the conservationist and writer who celebrated the boundary waters, referred to it as "the singing wilderness." A little corny, perhaps, but true. Its music is as quiet as the wind sighing in the trees and the water caressing the rocks and the eerie calls of the loons echoing across a thousand glassy lakes at dusk, but we can hear it even though we may be hundreds of miles away.

So. After all the work it takes to get in, what do you do when you finally find the place where you want to stay for a while? Not much, if the truth be known. You eat. You fish a little. You snooze on a rock in the sun. When it rains, as it did for two interminable days on our trek, you huddle forlornly in your tent, reading and crabbing at each other. You watch birds and go out scouting for critters. Maybe you practice throwing a rope over a tree branch, trussing up your food pack and lifting it higher than a bear can reach, until you get proficient enough to do it in the dark without dropping the thing on your head.

Bears are a brooding presence in the woods. I've helped a Minnesota biologist haul them, tranquilized, out of barrel traps and dens; I understand they pose no physical threat whatsoever. Yet even so, I can get spooked at night. Days, it's different; we look for them then. Several years ago, we spotted a mother and two burly cubs fussing at the shore only a few hundred feet from our tent on an island in Iron Lake. One of the cubs clawed partway up a tree, fell off into the water and floundered back as if nothing had happened. Then the mother sat back and pointed her long nose in our direction. An instant later, they vanished.

This time our encounters with wildlife were tamer. We watched an eagle feeding on some fish guts I had left on a ledgerock the night before. A gang of gray jays interrupted our dinner one evening, brazenly making off with several slices of bread; two of them sipped so much vodka-spiked Tang out of my cup that they could barely fly off when I reclaimed it. Sandy's huge northern pike gave us a couple of exciting tows in the canoe before we finally boated and released them. And then suddenly it was time to go.

Looking at the maps that morning, we discovered that getting back to Prairie Portage involved nearly ten miles of paddling and four overland carries, including one 1,059-yard marathon right after a 770-yarder. If we didn't finish up by sunset, moreover, we'd miss our rendezvous with Jeep La Tourell, the motorboat man who was supposed to ferry us back to Ely. So we packed up, doused the fire and reluctantly shoved off for the last time, heading south down the long, brawny lake named Agnes.

When we reached the final portage late that afternoon, I was bushed. While I hunkered down on the beach to rest, Sandy slipped into a pack, grabbed the paddles and started up the trail without a word. Old Nonstop Nellie. As I watched the back of her pack wobble into the brush, I thought: 30 years. After raising four kids, redecorating four apartments and four houses, doing all of the things you have to do on two farms—painting barns, shingling roofs, cutting and splitting wood, gardening, freezing, canning, killing chickens, putting up with two dogs, two horses, a half-dozen cats and God knows how many rabbits—after doing all of that while holding down six different jobs at one time or another as well, there she was in the middle of the Northern wilds still trying to out-tough her old high school boyfriend. And succeeding, too. I got out my notebook and hurriedly jotted down a few banal reflections on a canoe trip as a metaphor for married life. Then I put the notebook away, picked up the canoe and stumbled into the woods after her, a tired, happy, grateful 50-year-old grandfather with an appointment to keep. Jeep La Tourell was waiting for us when we reached Prairie Portage that evening and he did take us back to civilization in his boat.

At day's end, a modern canoe looks as timeless in the border country as the ancient rock it rests upon.

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4:50 SALT LAKE CITY 650 H14
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5:05 RALEIGH/DURHAM 356 H1
5:10 TORONTO 899 G2
MONDAY 3:56 P.M. APRIL 25,1988
6:00 NEW ORLEANS 211 H4
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By Lisa Liebmann

Braque steps out of the long shadow cast by Picasso

The artist's image has been dominated by that of his fellow Cubist, but now a full-scale exhibition celebrates his unique contribution

Pablo Picasso called Georges Braque "my dear old Wilbur," in honor of Wilbur Wright, when Braque was working on the paper sculptures—"aeroplanes," to Picasso—that would soon be flattened into two dimensions as elements in the ground-breaking Cubist *papiers collés* (collages). This was in about 1912, when both artists were just hitting 30, and the first thunder of their storm had already gone by. "We were like mountaineers on the same rope," Braque recalled in 1954, at the age of 72 and in failing health. "We both worked a great deal. We were no longer interested in museums. We used to go to exhibitions, but not so often as is generally believed. Above all, we were enormously absorbed."

The brief Cubist alliance of Braque and Picasso is of course legendary, and Picasso has on his own perhaps risen beyond legend to knock against the gates of myth. Next season, the Pablo-centric Museum of Modern Art will investigate the "marriage," as well as the progress of both artists through time, in a big Braque and Picasso show. Braque is upstaged by his prodigal partner; his paintings, especially the later ones, have not become such familiar icons. The more earthbound partner of this once-and-future team is at last the lone subject of a full-scale exhibition this summer at the

Braque said that *Musical Instruments*, 1908, was his "first Cubist painting." It remained a favorite.

Musée des Beaux-Arts, Le Havre

The Côte de Grâce at Honfleur, an early work typical of the time, was painted when Braque was only 23.

Braque was a soulful 40-year-old when this portrait of him was taken by his friend Man Ray in 1922.

Guggenheim Museum. The show closes September 4. It marks the 25th anniversary of Braque's death, spans the whole, deepening range of his long career and is the first retrospective of his work to be held in the United States since 1949.

Museums and exhibitions had been important to Picasso and Braque during the years immediately preceding their "Cubist adventure." Braque moved to Paris from Le Havre in 1900 when he was 18. Picasso, age 22, arrived from Barcelona in 1904, the year before the young Fauve painters, including Braque's childhood friends Raoul Dufy and Othon Friesz, along with Matisse and Derain, made their initial splash at the Salon d'Automne (SMITHSONIAN, November 1986). Cézanne, the man who said he wanted "to make Impressionism solid and durable, like the art in the museums," died in 1906, and during the summer of that year Braque traveled to Antwerp with his Fauve friend Friesz. In several paintings of the port of Antwerp and various nearby landscapes, dated August and September of 1906, the aggressive palette of Fauvism is instantly visible, inflected here and there by charming touches—bright little flags, for instance, waving blithely in a harbor—suggestive of the slightly older and delightfully decorative Dufy.

Braque then spent the late fall and much of the winter tracking Cézanne's haunts in the Midi. He returned to La Ciotat and L'Estaque, towns in Provence, in the summer of 1907 for a sojourn with Dufy. The paintings Braque made over the course of that single year demonstrate clearly what, for him, was the lesson of Cézanne. An organizing principle having to do with

mass, volume and rectilinear form—a legacy of Cézanne—also appears to be at work.

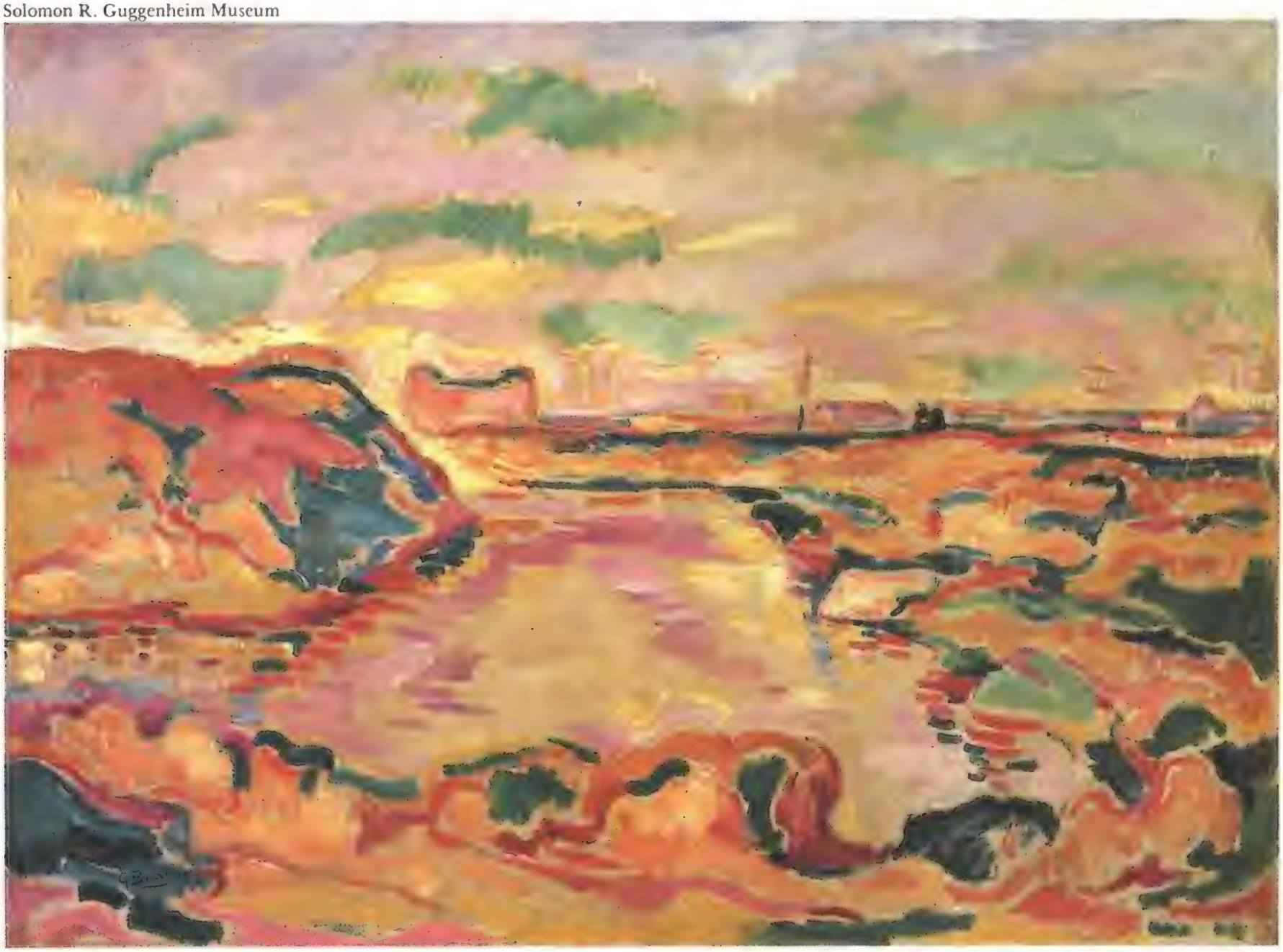
By the following summer, Cézanne's example of tonal intensity and compositional resonance had been absorbed—along with, perhaps, some up-to-the-moment pointers about simplified line from the already influential Matisse. Braque—who was later given to saying that people "stop seeing" by about the age of 25—was hereafter pretty well done with any further urge to paint faithfully from nature.

In *The Castle of la Roche-Guyon* from the summer of 1909, which Braque spent in the north of France, the illusory weights of masonry and foliage are almost exactly reversed in what we now see as a foreshadowing of the famous perceptual paradoxes of Cubism. Edgy-looking trees, or simply zones of rubbed-out greenish paint, seem more monumental than walls and turrets. Two years later, Braque all but stopped painting landscapes for nearly 20 years.

Braque had exhibited a few paintings at the Salon des Indépendants of 1906 and 1907, and in 1907 the dealer D. H. Kahnweiler and the poet-critic Guillaume Apollinaire both declared interest. Almost instantly, Apollinaire introduced Braque to Picasso who, in the winter of 1907, was working on that keystone of modernism, *Les Demoiselles d'Avignon.*

At this time, big, sturdy Braque was a sociable and sportive fellow. He was known as a good dancer, was something of an amateur boxer, and he loved to ride bicycles—one of his late paintings, in fact, is a kind of tribute to his bike. A few reports of him carousing through the streets of Montmartre brandishing a bar chair have also lingered through the years. But, intensely focused and ever dignified, he was and would remain the most methodical of artists. Picasso, one of life's gladiators (or matadors), had cast a much wider net for himself to accommodate his more Falstaffian appetites. He did not tarry long with Fauvism, but in addition to the great Impressionist and Post-Impressionist summations, he had plumbed his own

Solomon R. Guggenheim Museum



Braque painted *Landscape near Antwerp*, 1906, in Fauve style that burst on the modern art world in 1905. He did a dozen works in Belgium, where light wasn't ideal for vivid hues, then left for the Mediterranean.

Musée National d'Art Moderne, Centre Georges Pompidou, Paris

A good friend of composer Erik Satie, and ardent musician himself, Braque painted *Guitar and Glass: Socrate* in 1921. "Socrate" is a direct reference to Satie's dramatic symphony based on dialogues of Plato.

fire-and-ice legacy through the art of Velázquez and Goya, along with the grand French tradition, classical and romantic, from Poussin to Ingres, Delacroix to Degas, as he would do episodically and dramatically throughout his life.

Braque, it would apppear, was truly shaken by this introduction. The immediate repercussions of his exposure to the fierce and polyglot *Demoiselles*, seen gestating in Picasso's studio, can be assessed in a peculiar painting from 1907-08, called *Large Nude*. Here is suggested a baroque female cherub which, having developed prominent secondary sexual characteristics overnight, has been set down in jagged cement. Braque regained a tense composure in his last batch of youthful landscapes and—the call of the studio now ringing loudly in the air—in the first of the small still lifes that would prove to be the cornerstones of his large reputation. His *Musical Instruments* of 1908 (pp. 96-97), with its vaguely Spanish lilt and unstable planes, and *Pitcher, Bottle, Lemon* of 1909, which vacillates instead toward some implied Provencal angles and irrational light sources, are both formative Cubist paintings, executed from memory rather than models, that must have gleaned something from Picasso's theatrical verve. Conversely, the Cézanne-like colors and furrowed surface of Picasso's *Still Life with Gourd* (1909) suggest a shift toward Braque's more studied direction.

In 1908 Braque was given his first solo exhibition, the first contemporary one-man show that Kahnweiler had ever presented. In his introduction to the catalog, Apollinaire, as if prematurely clearing the way for Lindbergh's landing in 1927, wrote: "Georges Braque does not know what repose is, and each of his pictures is a monument to an endeavor which nobody before him had ever attempted." Braque's friendship with Picasso coasted slowly along that year, but went into high gear by the end of the next, at which time the word "Cubist," first coined skeptically, was beginning to be bandied about. With works such as Braque's etching *Little Cubist Guitar*, his paintings *Piano and Mandola* and *Violin and Palette* (opposite), all from 1909-10, and Picasso's brilliantly witty *Portrait of Ambrose Vollard*, painted the same winter, the collaboration was seriously under way. It lasted for about four years, until 1914 and the outbreak of war.

The years 1910 and 1911—the period of so-called Analytic Cubism—form one of the great, austere, Apollonian moments in art history in which the studio, as laboratory, is supreme.

Braque, born in 1882 in Argenteuil-sur-Seine, a Paris suburb, was the son of a house painter and decorator who liked to go out into the countryside on weekends and apply his pigments *en plein air*. The family moved to the Seine estuary, around Le Havre,

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when Braque was about 8, and he grew up there accompanying his artisan father on those Sunday painting forays and taking music lessons from Raoul Dufy's flutist brother, Pierre. Braque loved music all his life. He played several instruments including the accordion—he entertained the "Picasso gang" on a summer bus trip to the Midi in 1910, to visit Leo and Gertrude Stein—and would, of course, paint musical instruments as well. And he loved tools and materials. By the time he joined Dufy and Friesz in Paris, to study fine art, he knew how to stipple and striate, simulate wood grains and marble, and create all those trompe l'oeil and other illusionist surfaces so dear to French taste in general and to the great Franco-Spanish collaboration in particular.

Painting, pioneering and being pals

Between 1910 and 1912 the paintings of Picasso and Braque were practically twinned, stemming from a single formal impulse and often hard to tell apart. With the introduction, toward the end of this phase, of stenciled lettering and various collage elements—newspapers, wallpapers, etc.—they pioneered a kind of urban realism that can be seen as a precursor of Pop. Even the characteristic browns, grays and yellowed tans of Cubism suggest the cafés and lights of Paris, the murky hues of the River Seine. The two summered in the South together, at Céret (summer vacations may be among the unsung catalysts in modern art), and saw many of the same people—the Steins, the sculptor Henri Laurens, the poet Pierre Reverdy. In remembering this period, their acquaintance Matisse would touchingly say that "at that time we were not imprisoned in uniforms, and any daring or novelty that could be found in a friend's picture belonged to us all."

Individual temperament would emerge quite clearly again after 1912—the year, as it happened, that Braque met and married Marcelle Lapré. There had been an eventful Cubist exhibit at the Salon des Indépendants in 1911, at which neither Braque nor Picasso showed, and the following year two of its participants, Albert Gleizes and Jean Metzinger, published a treatise, *On 'Cubism'*, thus assuring themselves along with the "movement" a place in academic amber (and in the famous, revelatory New York Armory Show of 1913).

The deliberate Braque saw more purely formal ends in freedom. He later confessed that he had begun, by this time, to worry about "slipping into monochrome," and evidently found that the bits of wood-grain wallpaper he stuck onto a drawing titled *Fruit Dish and Glass*, or the piece of striated imitation wood that he attached to one called *The Guitar*, helped solve this problem: "The question of color was settled by the arrival of the *papiers collés*; that is something that the critics have never properly appreciated. It was then that I succeeded in distinctly dissociating color from form and seeing its independence in respect of form, for that was the great business: the color acts simultaneously with the form, but has nothing to do with it."

Solomon R. Guggenheim Museum

Analytical Cubism represented different sides of form all at once; *Violin and Palette*, 1909-10, shows how.

Picasso and Braque were in Sorgues in the summer of 1914, when Braque was drafted into the French Army. He was hit in the head on May 11, 1915, and was left for dead on the battlefield of Neuville-Saint-Vaast.

After being picked up the next day by stretcher-

Museum of Modern Art

The Table was among Braque's works in which sand, plaster and thin layers of paint were employed.

bearers, Braque evidently underwent cranial drilling. Having spent two days in a coma, according to various sources he recovered consciousness on May 13—his birthday. He was luckier than his friend Apollinaire, who died of wartime injuries. Nevertheless, Braque had a long convalescence, mainly in Paris and Sorgues, and would not really work again until 1917. His wounds would affect him the rest of his now more-sheltered life, apparent to visitors through a certain stiffness and slowness of movement. On January 15, 1917, however, his friends gave a banquet to celebrate his cure, and that year he submitted some writings, "Thoughts and reflections on Painting," to Reverdy's new magazine, *Nord-Sud*. In what must be a definitive explanation of Cubism—not to mention the whole French classicist tradition—Braque wrote that "limiting the means gives the style, engenders the new form and gives an impulse to creation. . . . It is often limited means that make the charm and the force of primary paintings. Extension, on the contrary, leads the arts to decadence. . . . I love the rule that corrects emotion. . . . I love the emotion that corrects the rule."

Making hay of words, paint and music

Intuition and evidence alike tell one that music—along with Marcelle, no doubt—played a key role in his recovery. Braque loved the works of Bach so much (there is a collage from 1913 called *Bach Aria*) that a few French theorists from formalist factions have seen fit to point out and make much of the similarity of their names. More to the point, living musicians had also been making hay of conventional structure, right along with painters and writers. "Joyce's language," wrote Wallace Stevens, who was himself Braque's contemporary and literary counterpart, "can be compared to the demolitions of Braque and Picasso or the music of the Austrians . . . When Braque says that the senses deform, the spirit forms, he is speaking to the poet, the painter, the musician, and the sculptor."

Braque, in any case, had become friendly with Erik Satie, whose *Socrate* of 1918—a setting of Plato's *Dialogues*, for four sopranos and chamber orchestra—was at least in part the inspiration for *Guitar and Glass: Socrate* (p. 100), a painting from 1921. When the composer died in 1925, Braque bought his piano from the estate, kept it all his life and remained friends with Darius Milhaud and Georges Auric, who were among the group of younger composers—Satie disciples—known as The Six.

The Musician (1917-18, oil on canvas) and *Guitar and Clarinet* (1918, paper and corrugated cardboard) are among Braque's first postrecovery works. These seem introspective, less nervously dynamic than the prewar paintings and collages, but they reflect the same

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principles of composition. Without the fever of novelty, composition itself, in the sense of color harmonies and line, emerged as Braque's essential preoccupation. Unlike Picasso—who had practically abandoned the fragmented formats of Cubism for a neoclassical and monumental smoothness—Braque evolved gradually and consistently, like a pot-au-feu. He soon stopped using collage elements to attend to the demands of paint, and with his studious series, the *Guéridons* (Pedestal Tables) and the decorative *Canephorae* of the early 1920s, he had established what were to be the poles of his later style.

The fruit-bearing female figures of Braque's *Canephorae*, loosely and coloristically painted, suggest a reprise of certain Impressionist concerns. Their sense of serenity and detachment lend further comedy to the disgruntled remarks made by Maurice de Vlaminck, the then out-of-fashion Fauve, upon seeing them. "Since Cubism," offered Vlaminck, "does not have the same lethal effects as syphilis, not all of its practitioners have died, and the survivors now claim the authority of Poussin, Corot and Ingres."

Braque's nudes and "bathers" of the late 1920s and early '30s also allude to some Picasso themes, but Braque's figures have a quality of ornamentation and abstracted reverie, not of heroic shape and erotic necessity. These works along with the bright and airy *Tablecloth* still lifes of 1933-37, for instance, are lyrical, chromatic essays. Even in a later, more intense painting such as *Woman with Easel* (1936) or *Woman with a Mandolin* (1937) or, especially, *The Painter and His Model* (1939)—with its brilliantly harmonized greens, yellows and blacks—the human figure registers as a recessive, literally negative, presence (a black silhouette), far more "still" than the still lifes that so frequently explode with vigor and animation into the foreground. In an interview near the end of his life, Braque explained why he depicted people in this way: "I had painted a great many portraits in my youth, almost all of them since destroyed. But this had never really interested me, and even when I painted figures, during the period of our Cubist research, I regarded them as still lifes. Picasso, on the contrary, has always painted real portraits."

Late in his life, Braque said to the art historian John Richardson that "scientific perspective was a ghastly

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The human skull has been used in art for centuries as a symbol of the folly of vanity and the quick passage of human life. Beginning in the late '30s Braque decorously painted skulls into some of his still lifes, including this one of an artist's studio.

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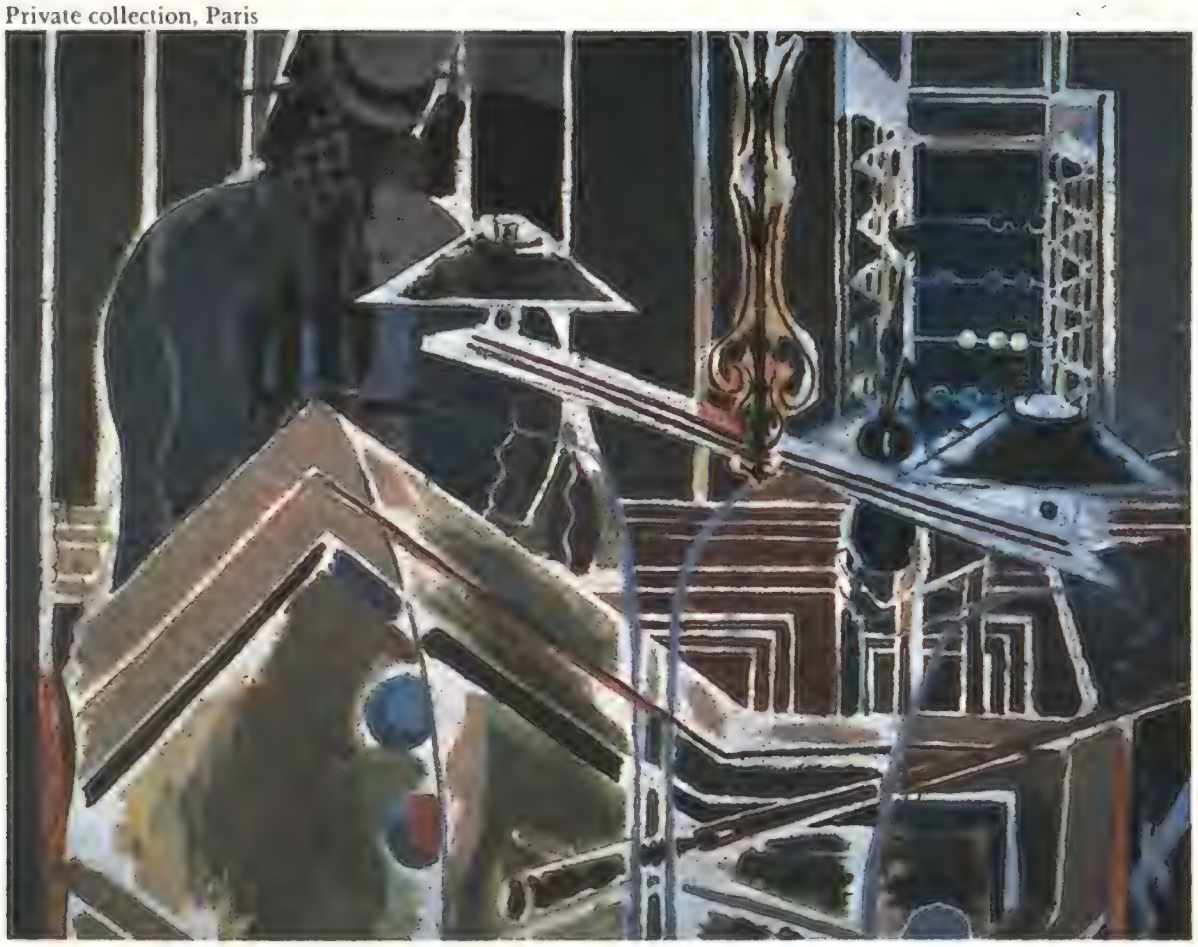

From 1944 to 1952, Braque painted seven virtuoso works depicting billiard tables seen from various angles. Complex works, they show how the artist could take an ordinary object and convert it, by means of the manipulation of color, design and structure, into a coordinated work of fine art.

mistake for artists—a trick that made objects seem farther away, not closer." Braque and his wife, Marcelle—the symbolic model, one supposes, for many of the figurative occurrences in his later work—were extremely private, and it is as if Braque had no external perspective on the human form at all. The positive, emotionally charged figure was out of his pictures. A near-exception such as *Patience*, painted in 1942 in the midst of war, proves the rule. Though psychologically informed, the woman in this picture—half in shadow, half in light, and drawn in the attenuated line and languishing pose reminiscent of the downcast café denizens of Picasso's early Blue Period—expresses the state in which we all become still lifes: the state of passive expectation, of waiting.

In sharp contrast, Braque's *Guéridons*, along with the recurrent musical instruments, easels, palettes, teapots, fruit bowls, dead fish, *vanitas* skulls and, most spectacularly of all, the magnificent *Billiard Table* series (above) of the middle and late '40s, convey all the force of character and animation of a rogues' gallery of portraits. If Cézanne's craggy, epic still lifes suggest the inexorable grip of time over a landscape, or if Bonnard, with his chromatically suffused ones, can evoke the blood rush of a moment's perfect contentment, Braque gives us a continual, ambiguous psychology. His still lifes are virtually portrait studies, and possibly, at times, they are the oblique self-portraits of a typically unvoluble man. Ezra Pound, who met him only briefly, described him as a likable man of few words. His considerable height and "huge craftsman's hands" were also frequently remarked on—not necessarily attributes guaranteed to endear him to Gertrude Stein, who idolized Picasso and whose relations with Braque appear to have been strained. In the early '30s Braque challenged her in print, claiming that she had "completely misunderstood Cubism," had tried to make of it a "cult of personalities" when, with its stylistic uniformity and sense of unified mission, it had to him been exactly the opposite.

In 1924 Braque had the architect Auguste Perret build him a simple, spacious, reinforced concrete house at No. 6 rue de Douanier (now the rue Georges Braque), near the Parc Montsouris and almost next door to André Derain. In 1931 he had a house built at Varengeville, near Dieppe, in the Normandy countryside of his childhood. The Braque household, childless, was completed by the presence of a dedicated housekeeper, Mariette Lachaud, and their social life consisted mainly of close relations with the family of sculptor Henri Laurens. Marcelle Braque and Mme. Laurens had been girlhood friends and the Laurenses' son, Claude, is Braque's principal heir. Claude Laurens, in fact, now lives in the Auguste Perret house with Satie's piano.

During the late 1920s and early '30s, Braque designed sets and costumes for Diaghilev's Ballet Russe production of *Les Fâcheux*, to music by Georges Auric, and for the Comte de Beaumont's production of *Salade*, with music by Darius Milhaud. But with his

two domiciles complete, Braque was free to live almost entirely within environments of his own devise. "I realized," he would say, "that I could go back over the same motif for as long as I liked. I no longer needed the sun, for I carried my own light within me." A limestone relief made at Varengeville in 1939, titled *Hymen*, and consisting of two facing profiles disposed as if on an altar, tells us everything else there is to know of Braque's domestic life.

There is an implicit world view in certain of Braque's later paintings—in the birds, for instance, that he painted in 1952 for a ceiling in the Louvre's Henri II Gallery—but it is a general and ecumenical one that is most similar to Alexander Calder's, or to Joan Miro's, in its sweet optimism, its lyricism, and its welcoming but impersonal tone. It suggests, as well, a late-in-life mood—some ultimate abandon or availability to spirit itself, the last distilled drop of yearning—that we may sense in artists as different as van Gogh, in his last visionary landscapes; Monet, in his last water lilies; or today in de Kooning's delirious dances with the brush. The sane and sedate Braque, however, once done with his grand symphonies of the studio interior, went out of doors again at the end of his life—on his trusty bicycle or else in his dark-green Bentley—to paint landscapes such as *Wheatfields* (1960) and *The Weeding Machine* (1961-63) that are surprisingly like those of poor, mad van Gogh.

Braque, though, was a master of the studious colors—black, gray, ocher, verdigris, brown and blue—the colors he always wore as well. "The task," he once said about painting, "is to find the temperature in which things can be kneaded—warm, in other words, but not too hot."

Braque's *Black Bird and White Bird* dates from 1960: "In 1910 I had painted birds . . . incorporated in still lifes, whereas in my latest things I have been haunted by space and movement," Braque said. These birds soar.

Private collection, Paris

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Lightning flashes illuminate observatory domes on top of Kitt Peak, southwest of Tucson, Arizona.

By Jack Fincher

Summer's light and sound show: a deadly delight

Using rockets instead of Franklin's kite, scientists probe a heavenly nightmare so we can protect ourselves from lightning

The picture was taken at night by a then-amateur who simply guessed at what camera settings to use.

When the Yosemite storm began, the five young California hikers took cover in a cavern beneath a granite outcropping and passed around their food. Signs along the trail had warned that it was dangerous to climb in bad weather, but they were not worried. Despite the rain starting to fall and the lightning bolts in every direction, what could possibly happen to people so snugly protected?

As if in godly answer the bolt struck. In seconds the atmosphere of the cave turned, in one survivor's words, "from heaven to hell. There was a tremendous roar, a sensation like a vacuum being created, then intense pain and my legs went numb." When he came to, Adrian Esteban, a laser technician from San Jose, gazed upon a scene of Hogarthian horror. Brian Jordan lay ominously still; Tom Rice and Bruce Weiner writhed in an agonizing fight for breath. Bob Frith was convulsing so violently that every spasm carried him closer to the edge. Esteban yelled for help, but Frith thrashed too far and fell 1,800 feet to his death.

In a storm over Tucson, lightning bolts flash within a cloud and from cloud to ground at the same time.

The exact sequence of events will never be known; Esteban estimates he was unconscious for about 30 minutes. But lightning had clearly been captured in a stone bottle. Evidently, one or more bolts struck at the mouth of the cavern and radiated like waves through the wet ground inside, flowing from body to body with devastating results. When rescuers reached them, two of the unlucky climbers were dead and two others faced the possible loss of their legs. Esteban was lucky. He suffered only minor burns—and the anguish of that searing memory.

This year, as every year, hundreds of Americans will be struck by lightning. Roughly 20 percent of those hit will be killed. The figures are fuzzy, but the best estimates range from 100 to 200 fatalities a year, with an average higher than that for other weather-related fatalities—floods, hurricanes and tornadoes—combined. Lightning this year will cause hundreds of millions of dollars in damage to electrical facilities, buildings, timber and airplanes; it always threatens the kind of major blackout that left sections of New York City looted and vandalized in 1977. One of the most spectacular losses in recent years was that of an Atlas-Centaur rocket carrying a Navy satellite, together worth $161 million, on March 26, 1987. The rocket was hit by lightning as it rose from the pad at Cape Canaveral. Its guidance-control computer was crippled, and the rocket automatically self-destructed. Millions more are lost when the threat of lightning causes activity to stop, whether in a $3-million-a-day delay in the launch of a Space Shuttle or when, for example, loading docks of an overnight delivery service are cleared at $1,000 a minute.

Until recent years, the phenomenon remained largely in the realm of natural curiosity, the mythic province of Zeus and his thunderbolts, the comforting land of aphorism where it never, ever struck the same place twice. But now a loosely organized band of university and government researchers may be starting to get the upper hand.

With networks of electromagnetic sensors, lightning strikes are being charted for the entire United States, often at the rate of 2,000 per hour. With cloud-piercing Doppler radar, arrays of radio receivers on the ground and instrumented planes, vans, balloons and rockets, teams of electrical engineers, meteorologists and physicists are attacking the electrical heart of the storm itself, probing the cloud's anatomy, measuring, recording and analyzing the data. From all this is emerging an increasingly comprehensive picture of the natural forces that shape and direct lightning's power.

Oregon-based Jack Fincher has written recently on tumbleweed, a haven for endangered equids, sand castles and the glory days of the flying clippers.

Lightning can arise out of snowstorms and sandstorms, volcanic eruptions, nuclear fireballs or, seemingly, the clear blue sky. But scientists prefer to analyze its most familiar form: the blinding streak of the cloud-to-ground discharge we see in thunderstorms. What actually happens when you see a jagged flash of lightning and, seconds later, hear the confirming clap of thunder?

A lightning bolt is a giant electric spark. Electric charges build up in the storm cloud and on the ground until the electric field becomes so strong that the air can no longer act as an insulator. An electric current of 10,000 to 200,000 amperes (a typical household circuit carries 15 amperes) flashes back and forth between cloud and ground.

It all starts when moist, heated air begins to rise rapidly and then cools. The result is a towering thunderstorm, or cumulonimbus cloud, whose top may rise to 60,000 feet or more. When the cloud reaches altitudes where the air temperature is on the order of 20 degrees below zero, precipitation particles form and start to fall. As the cloud droplets and ice crystals begin to fall, they drag the air along with them. The cloud has become a vertical column of violent air currents moving up and down at speeds of up to 100 miles per hour. Water and ice particles move with the air at dizzying speeds. Along the way, some particles become electrified: they lose or gain electrons and thus acquire a positive or negative charge.

We know that the positive and negative particles become separated in the cloud, although we are not sure of the mechanism (the violence of the updrafts and downdrafts, along with the enormous electrical fields, makes the inside of a thunderstorm extraordinarily difficult—and dangerous—to study). The positive charge generally accumulates near the top of the cloud, the negative lower in the cloud, near the freezing level. Most lightning, in fact, consists of current arcing between these two areas inside a cloud.

It will make your hair stand on end

Some does come crashing to the ground, however. The negative charge in the lower part of the cloud induces a positive charge on the ground beneath it. This charge can become so intense that the hair on your neck will rise and tall objects will begin to glow with a pale blue light, the phenomenon known as St. Elmo's fire. The actual strike is a complicated process. A faintly luminous *leader* emerges from the bottom of the cloud and moves toward the ground in a series of intermittent steps, 50 yards at a time, jumping farther every 50 millionths of a second. The average current moving downward is only a few hundred amperes. As the leader nears the ground, the positive charge there intensifies

Lightning that hit the nose of research jet can be seen exiting in two narrow channels from the right wing.

Hours before a Shuttle was to be launched in 1983, lightning struck perilously close to the launchpad.

David Rust and Robert Davies-Jones consider where to position their van to study the approaching storm. Two television cameras are mounted on top of the Mobile Laboratory; box at rear houses instruments.

until finally an upward discharge occurs and connects to the downward moving leader 20 to 30 yards above the ground; then all hell breaks loose. The return stroke rockets back up to the cloud at a third to a half of the speed of light, releasing a current of tens of thousands of amps and raising the temperature in the channel to 50,000 degrees F (or more)—five times the temperature of the sun's surface. Next, another leader forms but this one darts smoothly to the ground, following the path forged by the previous stroke. Another return stroke fires back up into the cloud. This may happen three or four times (the record is 26). The entire process is what our eye sees as a single, sometimes flickering, flash of lightning.

The virtually instantaneous heating of the air along the channel creates a supersonic shock wave that quickly slows down to the speed of sound. We hear the resulting sound wave: the noise of thunder. If you are close enough, you will hear a loud "crack" first, followed by a low rumble. Sound waves arriving at your ear from higher and higher in the channel—and thus farther and farther away—cause the rumble. Because sound travels at roughly a thousand feet per second, you can estimate the distance to where the lightning struck by counting the seconds from when you hear the lightning until you hear the thunder.

The power in a single lightning stroke can exceed 20,000 megawatts, enough to run the entire state of Arizona. But the peak lasts only a few millionths of a second, then falls off sharply. "You calculate energy in terms of power times duration," explains Philip Krider, chairman of the Institute of Atmospheric Physics at the University of Arizona, "which is why you could purchase the total energy equivalent from your local utility for $30."

Scientists hope to understand lightning so well that they can reduce the hazard to life and property. Until now, protection has appeared to owe less to the rigors of science than it has to an enigmatic philosophy of "May This House be Safe from Tigers." (Does the Zen prayer really work? the invoker is asked. Seen any tigers lately? comes the reply.) In somewhat the same wistful manner, lightning protection is presumed to function until it fails. The lightning rods used to protect buildings and trees, when properly installed, do work. The wires attached to them carry the current safely to ground. We are not so certain about the lightning arresters used to protect electrical circuits and elec-

tronic equipment. They appear to work most of the time. But as Martin Uman, an electrical engineer and director of the Lightning Research Laboratory at the University of Florida, says, "Nobody really knows."

We are beginning to find out. One of the first things we are discovering is that lightning is even a tougher challenge than we had thought. Krider and others have determined, for example, that the return stroke's turn-on time is so fast and its peak current so powerful, that both the electronics and aerospace industries must adopt new standards of protection: "What they have tried to simulate in testing isn't severe at all, it's just ordinary garden-variety lightning. Even that's very difficult to test under controlled laboratory conditions."

A ten-millionth of a second to react

The new findings do not affect the utility of lightning rods, but they do require still-faster response times by surge protectors. These devices are designed to filter out or shunt aside transient jumps in the voltages induced in the electric circuits. But they need a certain amount of time to react. It used to be thought that a lightning-caused surge in a line took a millionth of a second or more to reach its maximum and the devices were designed to meet that standard. Now we know the surge needs only perhaps a tenth of that time to reach maximum. The good news is that most of the modern, solid-state surge protectors used in the home are fast enough.

It behooves us to find out everything we can about lightning. Krider and his colleagues at the University of Arizona have developed sensors that enable scientists to analyze cloud-to-ground lightning. They have also developed sensors that monitor changes in the cloud electric field following a lightning strike and thereby find the source of the lightning. By measuring how the field regenerates, they attempt to locate within the cloud the source and strength of the cloud's charging current.

Another type of instrument, originally developed by Krider and Uman as a research tool, is being used to locate lightning strikes over the entire United States and in many other countries. The information is used both to issue warnings and to fill gaps in radar and satellite coverage. It is being examined for patterns that could help in storm forecasting. Raúl López and Ronald Holle are working on this at the Environmental Research Laboratories Division of the National Severe Storms Laboratory (NSSL) in Boulder, Colorado. Says López: "We don't ever expect to predict exactly which block of Denver will be struck at 2 P.M. today, but in the next few years we may be able to say there's a 60 percent chance of a high-strike day from noon till sundown in the south end of the city."

The ultimate goal is much broader. "Since lightning appears intimately bound up with storms, we hope ultimately to infer from it all aspects of destructive weather early in their formative stage: flash floods, hail, tornadoes and so on," López says.

David Rust, a scientist for NSSL in Norman, Oklahoma, does not wait for storms to come to him. Chief of the storm-electricity program, Rust heads up a search-and-record mission that seeks out storms. Using radar to track storms and a van packed with electronic recording gear, his five-member team races hundreds of miles over the Oklahoma countryside during the spring tornado season, intercepting big blows and occasionally launching instrument-carrying balloons. In 17 years of hot pursuit, says Rust, "NSSL scientists have gotten results we never would have by waiting for the storms to come to us."

One of the most intriguing things learned is that a lot of budding cyclonic storms appear to have a tremendous amount of in-cloud lightning but almost no strikes to the ground. Since that is the case, Rust says, "we have to study *both* kinds of lightning in the context of how a storm evolves. Should the difference prove critical, we could have a powerful indicator of cyclone buildup to use in severe storm warnings."

Prediction is one thing; learning to live with lightning where it cannot always be avoided is another. Airplanes are sometimes hit by lightning; in a period of

Colorado map shows lightning frequency between 4 and 5 P.M. Here .30 equals five strikes per square mile.

Research rocket (smoke on right) carried wire toward storm cloud; lightning (track at left) struck repeatedly.

a little more than 10 years beginning in 1970, some 1,600 strikes were logged by commercial and military aircraft. The Air Force alone reported seven planes lost, four from apparent fuel-vapor explosions, the others from loss of flight control or instrument malfunction. Designers have solved the fuel-vapor danger by using thicker metal on those areas of the wings in which fuel is carried; no commercial airliner is believed to have crashed from such an explosion since a 707 went down over Elkton, Maryland, in 1963. The Boeing Company estimated in 1984 that the *average* for all models of its planes now flying all over the world is one lightning strike per plane per year. Typically, lightning will strike an extremity (a wingtip, the nose, the top of the vertical stabilizer), move along the outer shell and exit from another extremity (p. 113). The flight crew may be momentarily blinded, instruments may be affected, but the airplane stays in the air.

Less protection from graphite and epoxy

The urgent need now is to better protect the solid-state electronics modern aircraft depend on. The next generation of aircraft will employ new materials, laminates of graphite and epoxy, that are far more susceptible to lightning than are the aluminum and titanium alloys now used. The metal shell of an airplane, like that of an automobile, forms what physicists call a Faraday Cage: electric current will flow around the metal but not into the interior space. Because graphite and epoxy do not conduct electricity as well as aluminum and titanium, they will not work as well at keeping the lightning on the outside. Not only will computerized navigation and communication systems be more vulnerable, advanced avionics increasingly involved in actual flight—the so-called fly-by-wire technology that depends on automated control of everything—will need protection, too.

Civilian aircraft generally can fly around storms or wait them out, but all-weather military planes cannot. A Navy spokesman at a lightning conference gave this account of what happened to one pilot in a thunderstorm:

"The instrument panel lit up and essentially told him his [engine] RPM was dropping rapidly, his hydraulic system was about to fail, his navigation instruments were unreliable and his wings were ready to fold. [Then] his radios failed, his landing hook actually came down and his bomb-bay doors opened. As he flew out of the storm, all systems returned to normal and he landed safely. *We don't need incidents like this.*"

A pivotal question about airplanes is whether they, like some skyscrapers and other tall structures, sometimes trigger their own lightning, sending out a leader that evokes a powerful return current from the cloud.

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In experiment, lightning will come down cable to strike canister used in underground nuclear tests.

Philip Krider at the University of Arizona checks sensor used to study how clouds generate electricity.

Martin Uman, right, Ewen Thomson, left, and Marcus Rubenstein calibrate a spherical antenna in Florida.

To find out, a specially equipped NASA jet, guided from the ground by Vladislav Mazur, a Russian-born electrical engineer working for the NSSL, spent two years flying through storms off the Virginia coast. The finding was that in almost every case, the plane triggered the lightning that struck it rather than accidentally encountering a flash.

Variations on a theme by Ben Franklin

Other experiments are aimed at learning how to better protect airplanes and other delicate mechanisms, including nuclear warheads. Small rockets trailing fine copper wire are fired toward storm clouds over the Kennedy Space Center. Ground strokes follow the wire back down to the launch platform, in the process striking the body of an airplane or whatever device is being tested (p. 116).

NASA project manager Bill Jafferis got into lightning-protection research through a near-tragedy that struck the moonbound Apollo 12 in 1969. With three astronauts aboard, the spacecraft was hit by lightning twice within a minute after launch and would have tumbled to destruction had the crew not reset the guidance computer. His greatest concern today is less one of lightning protection than of lightning forecasting, with an eye toward using the storm dynamics as a precursor to enable meteorologists to make a 30-minute to three-hour prediction that would free the Shuttle from its overriding weather constraint: the need to launch and, more crucially, reenter and land with absolutely no threat of inclemency.

The research goes on, but in the meantime people are still being hit by lightning. Dr. Mary Ann Cooper does not look like a medical pioneer, but the brisk, young research director in emergency medicine at the University of Illinois at Chicago College of Medicine certainly qualifies. "About ten years ago my cousin by marriage was on a cherry picker that came into contact with a high-voltage installation," she remembers. He was seriously injured. "The family started asking me all these questions about electrical shock and I didn't know anything about it. So I put together a lecture for paramedic types, and darned if a nurse didn't pop up and ask what happens when you get hit by lightning."

Her subsequent search of the literature showed that not many others knew much, either. Cooper started pulling out all the reported cases she could find, collecting others from fellow physicians and augmenting them with her own mounting experience at the University of Louisville, where she was then Residency Director of Emergency Medicine. Today she is probably the nearest thing to an expert the medical profession has, in an area of trauma whose effects are so capricious.

Although both lightning and high-voltage injuries

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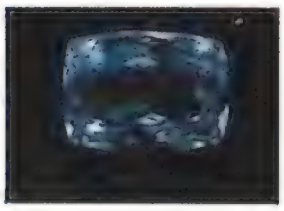

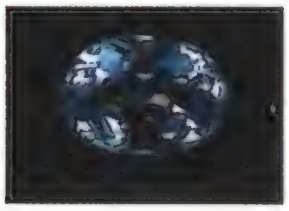

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follow the same physical laws, Cooper explains, vitally important differences produce different trauma and dictate different treatment. Lightning is direct current, unlike the alternating current produced by your local utility that causes multiple muscle spasms and often "freezes" the victim to the current source. A prolonged exposure can result in deep tissue damage requiring amputation. Lightning exposure is generally so quick that the massively larger voltage and amperage rarely harms, much less enters, the skin. Instead it "flashes over" the body, a phenomenon, Cooper writes, that "usually saves you from being fried." In effect, the body acts as a lightning rod as the stroke hurtles downward, frequently turning skin moisture to steam and blasting apart clothes and shoes to leave the victim all but naked and in most cases unconscious.

The most celebrated case can be found in the *Guinness Book of World Records.* From 1942 to 1977, Park Ranger Roy "Dooms" Sullivan of Virginia was struck *seven* authenticated times by lightning, losing in the process a big toenail, his eyebrows and his hair (to fire, twice) and suffering minor burns to his left shoulder, chest, stomach and ankle.

Because of their frequent disarray, confusion and loss of memory, those hit by lightning while alone are sometimes mistaken for victims of assault. They may have broken bones from having been thrown to the ground by a single, strong muscle contraction. The main cause of death is usually cardiopulmonary arrest, which means immediate first aid may be lifesaving. According to Cooper: "Triage (the setting of priorities for those to be treated) is entirely different from most multiple casualty incidents. Usually you first help the victims who are moderately injured and who could clearly benefit from medical care. But in lightning strikes 'resuscitate the dead' is the rule, since those who already show some return of consciousness or spontaneous breathing are generally well on the way to recovery."

One future benefit of lightning research will be knowing places to avoid. López and Holle hope the day is coming when strike-frequency data such as theirs will take their rightful place in environmental-impact reports. Utilities already consult them informally so they can avoid hot spots when routing transmission lines. Unfortunately, nobody checked before a major new tournament golf course was constructed in the shadow of Castle Rock, Colorado, which because of topography and prevailing winds may well be the lightning capital of the state. In the summer, according to their calculations, the area receives more than 15 strikes per square mile.

Wherever you are, there are rules that will help you avoid being hit:

*If inside a house, stay off the telephone, unplug appliances, keep away from plumbing fixtures. Anything that can carry current from outside to inside is a potential hazard. Install surge protectors, which short-circuit lightning attempting to enter on electric or television wires.

*If outside, try to wait it out in a nearby building or in a nonconvertible car with the windows rolled up, or—as a last resort if stranded in the open—in a thick stand of small trees. *Don't* seek refuge under a solitary tree or beneath golf-course sun and rain shelters, which may be directly struck. *Do* stay away from water, wire fences, rails and other horizontal conductors that could convey deadly current to you from a distant strike.

All of this is common-sense advice, yet people ignore it, to their peril. David Rust cannot forget taking his family to one of those mega-amusement parks with a giant swimming pool and futuristic water rides. When the skies turned suddenly overcast, Rust was alone in ordering his children out of the pool. The first lightning flash to the ground was less than a mile away, he remembers. "Management's immediate response was to distribute umbrellas—with metal supports—to their lifeguards. The long lines of people climbing towers to come down the slides were ignored.

"A number of flashes occurred and they *still* let people stay in the water, hundreds of them," Rust marvels. "Only after heavy rain began to fall did they clear the pool and offer a raincheck. I hope it was ignorance instead of greed. A strike a hundred yards in a different direction and you would have had a carnage equal to the yearly lightning fatalities for the whole United States!"

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By Mark Bernstein

A self-starter who gave us the self-starter

"Boss" Kettering dreamed up devices that revolutionized automobiles once and for all

Kettering poses in Deeds' barn with his self-starter, which in 1912 did away with recalcitrant, dangerous handcranks.

The paint manufacturers were pleased with themselves. Earlier in 1920, Charles Kettering, the research chief at General Motors, had called them in and given them a dressing down because paint was such a stumbling block in the mass production of cars. In those days every sedan that rolled off the assembly line had to be painted by hand, brushstroke by brushstroke. The coats were many, the drying was slow and the whole thing took as long as 37 days.

Now the paint men had good news for Kettering. It just might be possible, they told him, to get the job done in a month. Kettering, then in his mid-40s, a long, lean, large-featured man with patience proportionate to the size of the minds he was dealing with, was not pleased. "An hour would be more like it," he snapped.

Kettering never wanted problems improved; he wanted them solved. His first major solution had come in 1911 when, as an inventive young engineer scrounging parts in an Ohio barn, he developed the self-starter for Cadillac. Later successes—high-octane gasoline, the diesel locomotive and others—came after 1920 when he was backed by the limitless resources of General Motors (GM). Success, however, owed less to economic resources than to a rare quality that Kettering possessed in abundance, something he called "intelligent ignorance," a kind of well-informed curiosity coupled with the persistent willingness to try, which he was now about to apply to the paint problem.

Shortly after his session with the paint manufacturers, as Kettering related during an antitrust suit against the Du Pont Company, he happened to be in New York browsing Manhattan's Fifth Avenue. There, in a jewelry store window, he spotted a wooden pin tray finished with a lacquer he'd never seen before. He bought the tray, tracked the maker of the lacquer to a backyard shed somewhere in

New Jersey and bought some lacquer, too. Working with Du Pont, he homogenized the lacquer with existing paints, producing a liquid, thin enough to spray, that dried—glossy and weather-resistant—in minutes.

The paint people stayed skeptical. Kettering later liked to tell the story of how he then invited one doubter to lunch, talked paint and then walked the man to the GM parking lot, where the guest confessed that he couldn't find his car. Kettering pointed to a vehicle and asked: "Isn't that yours?" "It looks like mine," the paint man replied, "but my car isn't that color." Said Kettering: "It is now."

The story typifies the resourcefulness Kettering brought to the solving of industrial problems. Those solutions are many—at his death in 1958, he was responsible for more major inventions than any American except Edison. That date, incidentally, also marks the approximate high point of American industrial supremacy. The question of how best to regain that supremacy may in part be answered by looking at how Charles Kettering, among others, first created it.

Highly creative "Barn Gang" included William Chryst, William Anderson, Kettering, Edward Deeds and unidentified friend.

In 1905, Kettering, in bow tie, ran NCR's Inventions Department No. 3.

For Kettering, preconception was the trap. He scorned theorists, particularly "the slide rule boys" who, he said, would whip out their slide rules, make two calculations and often decide something was impossible. Calculations were based on theory, which, Kettering held, was merely the summary of experience, not the limit of possibility.

Birth, happenstance and experience had made Kettering empirical. Born in 1876 near Loudonville, Ohio, he grew up with a farmer's easy familiarity with the ways equipment is turned to task. Happenstance was a physical handicap, a lifelong weakness in the eyes, that made prolonged study difficult, forcing him to withdraw from Ohio State University during his freshman year. Experience followed in Ashland, Ohio. Here, as foreman of a jerry-built telephone exchange, he developed a fondness for improvisation—and an attachment to Olive Williams, a local girl who later became his wife.

Determined to get an education, Kettering reentered Ohio State, and the university bent to accommodate him. The engineering department waived the drafting, which his myopia and chronically inflamed eyes made impossible for him. His roommates protected his sight by reading each day's lessons out loud to him at night, a helpful practice that continued until Kettering's graduation, at age 27, in 1904.

The myopic young electrical engineer was recruited by Edward A. Deeds, superintendent of National Cash Register (NCR), who brought Kettering to Dayton and assigned him the task of electrifying the cash register. He succeeded, and in his five years there acquired a reputation as a leader and the name "Boss Ket," mingling affection with respect, by which he would be known the rest of his life. He also showed remarkable skill in reading the market. Of his days at NCR, Kettering said later, "I didn't hang around much with other inventors or the executive fellows. I lived

Mark Bernstein is a Contributing Editor of Ohio Magazine. *He is writing a book about Dayton and the extraordinary inventors who worked there before World War I.*

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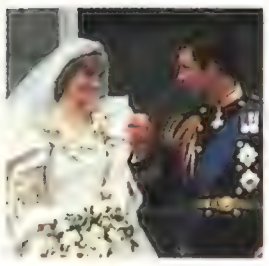

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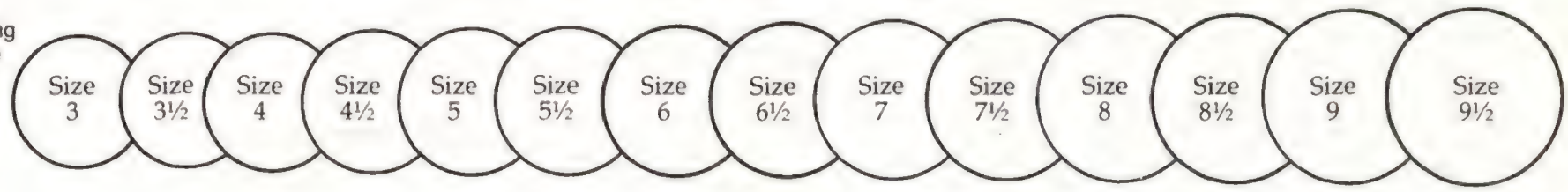

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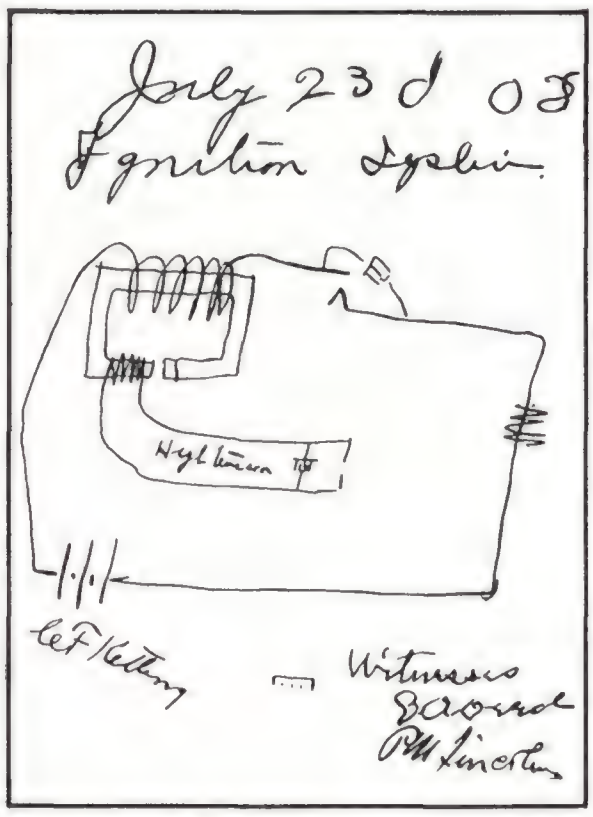
with the sales gang. They had some real notion of what people wanted."

By 1908, what people wanted above all else was a motorcar. The great romance of the 20th century—Americans and their automobiles—had just begun to blossom. Ed Deeds shared the passion and pointed Kettering toward the commercial possibilities. "There is a river of gold running past us," he said. "Why don't we throw out a little dam and sluice some of it our way?"

They set up shop in the barn behind Deeds' house. Still an NCR employee, Kettering could give this new project only his evenings and his weekends, and eventually almost all the Ketterings' $1,500 savings, which went to buy machine tools. Kettering's first achievement, completed in the summer of 1909, was an improved ignition system, greatly extending the life of the dry cell batteries then used in automobiles.

Deeds, the businessman of the pair, presented the device to Henry Leland, president of Cadillac. Within weeks, Leland ordered 8,000. The order caught Kettering and Deeds with not so much as a name for their firm. Scrambling, the partners subcontracted production and formed the Dayton Engineering Laboratories Company. Kettering resigned from NCR; his next project would make his company better known as Delco.

Cadillac's president, Henry Leland, ordered 12,000 self-starters in 1911.



First sketch of ignition system was used to apply for 1908 patent.

Early in 1910, a woman's car stalled on Belle Isle Bridge in Detroit. With minor gallantry, a passing motorist named Byron T. Carter offered to restart it for her. Rolling up his sleeves, he inserted the handcrank and, bracing his legs, gave it the kind of furious turn required to start a car in those days. Cranking a car, it used to be said, "required the strength of a Samson, the cunning of Ulysses and the speed of Hermes." On this particular occasion, the gods were against gallantry—the crank snapped back, breaking Carter's jaw; complications set in and he died.

The death greatly troubled Henry Leland: the car was a Cadillac and, besides, Carter had been a friend and fellow car manufacturer. The automaker approached Kettering, hoping he could develop a safe alternative to crank starting.

Kettering solved the problem by increasing it in scale. He assumed an electric motor *could* crank an engine. More important, he realized that once the engine was running, the starting motor could serve as a generator as

well. The addition of a storage battery would complete a system that would start the car, generate electricity for lighting and ignition, and store excess electricity for future starting. In short, essentially the system used to this day.

Many others had already tried electric self-starting. They had all failed, Kettering concluded, because they had mounted the motor directly on the engine. What this meant was that the motor was geared to the engine at a one-to-one ratio, without any mechanical advantage.

Kettering set up a Cadillac engine on a concrete pad poured on the dirt floor of Deeds' barn. He borrowed a ¼-horsepower electric motor and tracked down some sprocket wheels and chains. He used these to manipulate the gear ratio between the electric motor and the engine, until the former had the mechanical advantage it needed—about 20:1. Kettering's cobbled-together creation looked like a refugee from a farm implements auction, but it worked.

What had been proved possible now had to be made practical. That task fell largely to the "barn gang," a cluster of young technicians, many of them moonlighting from NCR or NCR alumni, whom Kettering re-

Auto mogul Alfred P. Sloan helped found Sloan-Kettering Institute.

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Despite the photograph, few women mastered the crank. When a man died helping a lady in distress, Kettering was called in.

cruited and set to work in the corners of Deeds' barn. There the crew designed, drafted, machined, wired and wound each component required for Kettering's new starting/lighting/ignition system.

Speed was crucial. Many inventive competitors were already in the field. Besides, Leland needed Kettering's system in time for his 1912 models. One of the crew recalled, "We didn't know about 5 P.M. All we knew was light and dark." They just met the deadline, the last few days working around the clock.

Introduced by Cadillac, the self-starter made the handcrank instantly obsolete. Kettering's system was probably the most important single step toward making the motorcar practical for everyone. Delco boomed with demand for the starters. Within two years employment jumped from a handful to 1,500.

With prosperity, Kettering could settle Olive and their 5-year-old son Eugene into Ridgeleigh Terrace, a handsome, gray, wood and fieldstone house south of Dayton. Olive Kettering made it a gathering point for Dayton society, who in turn became the audience for her husband's elaborate practical jokes. At one company party, Kettering claimed he could fire a rifle so accurately the bullet would split on a knife's edge, with the halves extinguishing candles set to either side. He did so, to awed and enthusiastic response. The candles had actually been blown out by tiny bellows hidden in their holders.

Engineering projects multiplied. In addition to Delco, Kettering and Deeds formed one company to mass-produce generating systems for farm lighting, a second to build aircraft engines and combat planes for World War I, and a third for pure research. Boss Ket was no businessman—he didn't dislike administration, he ignored it. His secretary at Delco had standing instructions to tell unexpected callers he was dead.

In 1919, Kettering and Deeds decided to accept a series of buyout offers from General Motors. Though prepared to pay for the body of Kettering's work, GM was mainly interested in his brains. The company wanted Kettering to head a new research division. He accepted the post, one he would hold for more than a quarter-century.

Logically, Kettering used to say, industrialists and researchers were allies, but reality wasn't a party to the

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First car equipped with Kettering's "electric starting, lighting and ignition" was this 1912 Cadillac, which sold for $3,250.

agreement. "Looking at any research problem," he said, "the general tendency is to make it too ingrown. . . . by that I mean referring to research as the solving of manufacturing difficulties only, and not the bigger problems of the future."

On joining GM, Kettering had demanded the right to pretty much pick which problems to pursue. He chose three. With the first, auto paints, he was entirely successful, bringing speed and a weather-resistant gloss to the glacially slow world of auto finishes. His second effort was an experimental air-cooled engine that would bypass all the fuss about radiators that boiled over or froze, but there he met major disaster. In 1923 the project came to an end as a $31 million write-off. It was not until the 1940s that Volkswagen became the first company to successfully market mass-produced, air-cooled automobiles.

In some ways, though, engine knock was the most challenging problem of all. Knock is a failure of gasoline combustion that causes a rattling sound and robs an engine of pulling power. When Kettering approached the problem, knock was the ceiling to all efforts to raise engine performance. The phenomenon itself, however, was little understood. For a long time no one was sure whether knock was a fault in the engine or a fault in the fuel.

One of Kettering's researchers, Thomas Midgley, was the man who finally demonstrated that engine knock was a fuel problem, but the discovery posed some difficulties. For one thing, fuel was not directly the business of General Motors. For another, neither Midgley, a mechanical engineer by training, nor Kettering was an expert in fuel chemistry.

Characteristically, Kettering surmounted both difficulties by ignoring them. Although GM did not produce fuel, its products, its business and its customers suffered the impact of fuel problems—which was more than sufficent reason to continue. Kettering always suspected experts who seemed to him too pleased with, or limited by, what they already knew to learn much of anything else. He figured that Midgley—who possessed Kettering's prized quality, "intelligent ignorance"—might do better.

So it proved. Pondering why kerosene knocked worse than gasoline, Midgley hypothesized that it was because kerosene was lighter in color. Chemically, the idea was ridiculous.

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Knowing little chemistry, Midgley tried to reduce knock by dyeing kerosene with iodine, the stuff most people then rubbed on wounds as an antiseptic. Iodine didn't eliminate knock, but it diminished it.

Further experiment, of course, showed that color had nothing to do with it. But something in the iodine was clearly suppressing engine knock. A two-year "scientific fox hunt" followed, in search of a commercially feasible knock suppressant. Dozens were developed and tested. It wasn't until December 1921 that Kettering researcher Carroll Hochwalt poured a half-ounce of a newly synthesized compound into the lab's test engine. The liquid, tetraethyl lead, proved to have 40 times the knock resistance of iodine. "Hell," Hochwalt said later, "it was 'Eureka!' "

The research team and the Boss had hardly started celebrating when it turned out that tetraethyl lead damaged exhaust valves. Adding bromine prevented this damage but the element was not available in sufficient quantities. Kettering sought a supply far and wide. He sent a chemist to the Dead Sea to learn if bromine might be extracted from the salt there, and then traveled to French Tunisia to investigate bromine mining operations firsthand. He even shipped 25 barrels of the Atlantic back to his labs to see if the oceans might be a source. And seawater, rich in bromine, yielded the answer. Triumphantly, Kettering leased a freighter and cruised up and down the New Jersey coast, extracting his final ingredient at very low cost.

Kettering's experimental World War I "Bug," a prop-driven precursor of Adolf Hitler's buzz bomb, shucked its wings and fell to earth.

Thomas Midgley led team that finally solved the problem of engine knock.

Tetraethyl lead created high-octane gasoline, and this in turn permitted introduction of high-compression engines. These were much more efficient than earlier engines—an improvement, Kettering claimed in 1958, that was theoretically saving American consumers from $5 billion to $8 billion a year.

When Kettering joined General Motors in 1920, the sales figures and efficiency of GM's array of vehicles badly trailed Henry Ford's single Model T. By 1927, the organizational brilliance of GM's celebrated president, Alfred P. Sloan jr., coupled with a plethora of improvements from Kettering's busy lab, had helped drive the Model T into retirement. With a Ford, went the inevitable wisecrack, you could have any color you wanted, provided it was black. At GM, you could have all sorts of colors. And you could have higher horsepower for more zoom, and the new "balloon" tires for a smoother ride, as well as all the other improvements that made each year's model comfier than last year's.

Americans loved it, turning the nation into the world's first automotive society. To the Boss, this was the test that mattered; not results in the laboratory, but response in the marketplace, which Kettering unquestioningly believed consumers ruled. Once the public saw something better, Kettering held, it would settle for nothing less. Henry Ford once told Kettering that the Model T would never adopt a self-starter. Kettering replied, "Mr. Ford, that is something you yourself are not going to have anything to say about."

Kettering's sense of the market meshed with his grasp of unfolding technological capability. He was broadly rather than deeply knowledgeable, a synthesizer who could, an associate said, "visualize how things ought to go and push them that way."

General Motors followed his lead. As early as 1928, Kettering persuaded fuel researcher Midgley to look for a safe, effective refrigerant. Midgley developed freon gas, which made a household word out of a struggling division called Frigidaire. Kettering began tinkering with the diesel engines on his yacht, the "Olive K," and half a dozen years later presented the world with the first lightweight, high-speed diesel locomotive.

Kettering believed that, although in the world the inventor must move and shake, in the lab his task often was to ask questions, listen and encourage. Here, contrast with Edison is instructive. Edison was a terrier; he'd snag hold of a problem and wrestle it

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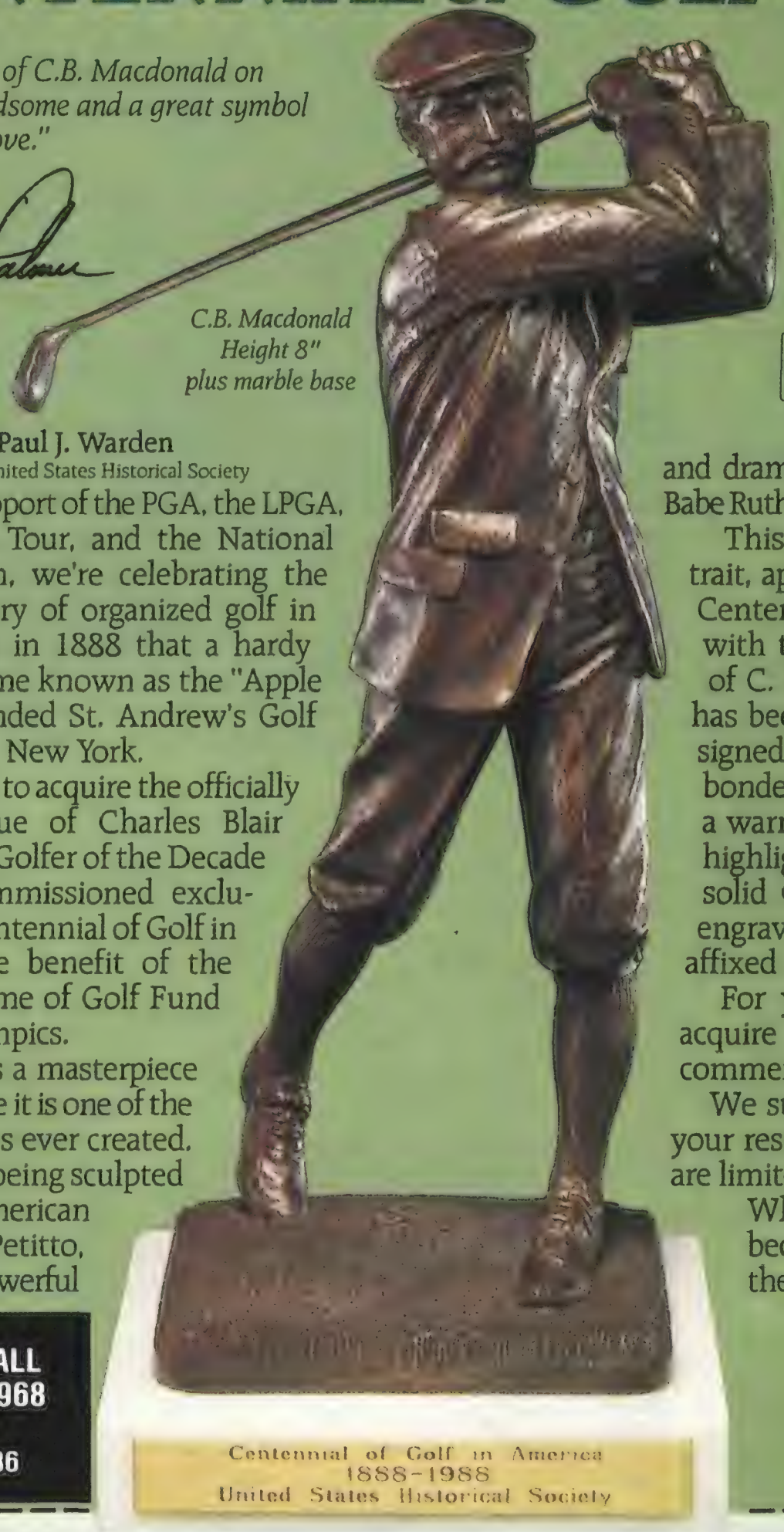

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Tiny postwar racer with first retractable landing gear could stand 12 men (Kettering at far right) on its stubby wings.

into exhausted submission. Kettering could be a terrier too, once he had an idea to pursue. But he believed that a problem was more than willing to be solved, provided the researcher remembered who was boss, by which he meant the *problem*, not himself. The only difference between a problem and a solution, he used to say, is that people *understand* the solution. Solutions only involve a change in perception, since the solution must have existed all along—within the problem itself. A researcher, he argued, was there not to master the problem but to make it give birth to its solution.

The diesel locomotive was a case in point. "We didn't design it," Kettering said. "All we did was run errands for it. We said to the engine: 'Now here are half a dozen pistons, you tell us which one you like. And here's half a dozen valves; try 'em out.' We let the engine evaluate things for four or five years, and finally we put it together. I said, 'If that engine doesn't work it's not our fault.'"

In 1934, a locomotive powered by Kettering's new diesel engine made the run from Denver to Chicago to mark the second season's opening of the Century of Progress exposition. The trip had previously taken 24 hours with a steam engine. Before a crowd of 100,000, Kettering's diesel, with an elapsed time of 13 hours 15 minutes, snapped a tape strung across Chicago's Halsted Street.

By that time, Kettering was unquestionably the nation's best-known engineer. In 1933 *Time* put him on its cover and the *Saturday Evening Post* ran a series about him. Fame permitted, or encouraged, foible. Kettering dressed simply, loved flying, fell asleep at the cultural events favored by his wife and never carried any cash. He would invite people to lunch, explaining when the check came that they would have to pay. Once, in Dayton's Union Station, his guest remonstrated, "Tell me, Ket. Two blocks up the street you *own* the Moraine Hotel. Why didn't we just eat there?" Said Kettering, "It's simpler this way."

Kettering owned a hotel because he was, by then, a *very* rich man. The

early buyout by General Motors had been largely for stock, lots of it, which formed the basis of a fortune that at his death was valued at $200 million. But Kettering seemed genuinely indifferent to wealth. He often tooled around in a bottom-of-the-line Chevy, not only in Detroit but at his winter home in a Florida enclave for the very rich. Asked why he drove the only car in sight not a Cadillac or Rolls-Royce, Kettering replied, "I don't want to be conspicuous."

Yet wealth broadened Kettering's pursuits. He was a staunch sponsor of medical research, cofounding the Sloan-Kettering Institute for the study of cancer in 1945, the year before Olive Kettering died of the disease. He was a major benefactor of Antioch College, which has a work-a-term, study-a-term program. Near its campus in Yellow Springs, Ohio, he set up and financed an independent investigative effort into the workings of photosynthesis that lasted 50 years. He had hoped to find an alternative to fossil fuels.

Kettering retired from General Motors in 1947 at age 71, but was still much sought after as a public speaker and down-home anecdotalist. In his remaining decade he became the nation's acknowledged spokesman on industrial progress and research. Gathering himself at the podium, he would peer out over his gold-rimmed spectacles, and like an old-fashioned professor who warmed to his audience as much as to his text, would tell tall stories in a twangy voice. He talked about research and education, and as he neared 80, he spoke increasingly of failure. He was for it.

"I think it was the Brookings Institution," he told one audience, "that made a study that said the more education you had the less likely you were to become an inventor. The reason why is: from the time a kid starts kindergarten to the time he graduates from college, he will be examined two or three or four times a year, and if he flunks once, he's out. Now an inventor fails 999 times, and if he succeeds once, he's in. An inventor treats his failures simply as practice shots."

In 1947 Kettering, at 71 a millionaire and America's most famous engineer, was still absorbed by what went on under the hood.

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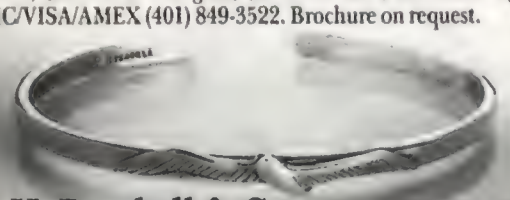

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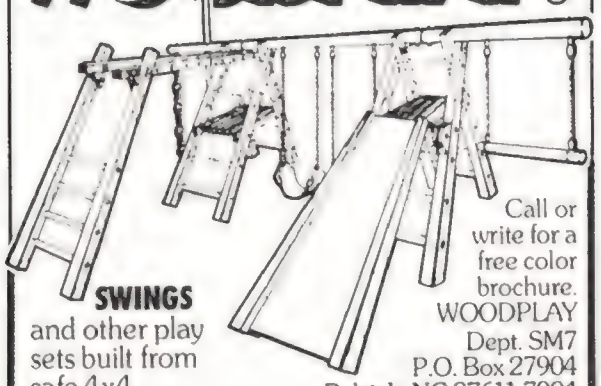

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Book reviews

The Secret Lives of Trebitsch Lincoln
Bernard Wasserstein
Yale University Press, $27.50

The protagonist is well established and the plot is set, but this isn't a novel. It could be. It would make an ideal picaresque, perhaps a saga or even a fantasy, but it is instead the biography of a man "who left barely any footprints in political history, whose literary relics are without enduring value, and whose fame . . . is unlikely to be regarded . . . as a significant contribution to the advancement of historical understanding." Despite all this, Brandeis University historian Wasserstein tells us, he wrote the book anyway. Let's be glad he did; it's fascinating.

Ignácz Trebitsch was born in central Hungary in 1879, the second son of a pious, middle-class Jewish family. By the time he reached 19 he was of medium height, stocky and possessed of "beautiful brown eyes, . . . his hair a mass of black curls." He had a gift for charming those around him and loved to be the center of public attention, which unfortunately became that of the local police who were after him for the theft of a gold watch. For the first time, but not the last, Trebitsch fled.

Not only did religions other than his own hold great appeal for Trebitsch, but converting Jews to Christianity was a popular movement of the time. Our handsome young exile quickly succumbed to both, becoming not only a convert from Judaism (and renaming himself Ignatius Timotheus Trebitsch) but an active Protestant missionary as well. With a messianic zeal that was to become his persona, the glib Hebrew proselyte presented the claims of Christ

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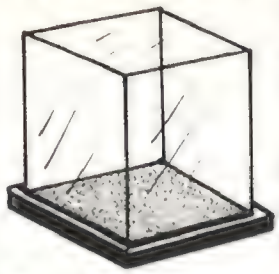

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to audiences in London, in Hamburg, in Montreal. There is no record of Trebitsch ever having converted a single Jew to his new Lord, but there is considerable evidence that his concern during this period was as much for his bankbook as for the Good Book.

Still, he impressed his superiors to the extent that in 1902 he was ordained a deacon in Montreal's Christ Church. He soon demanded an increase in pay, threatened resignation if he didn't get it, didn't get it and ran off to Hamburg, then to England where he popped up the next year as curate in a parish in Kent. He flunked a subsequent examination for the priesthood, but did our Hungarian Elmer Gantry jump out the chapel window in his disgrace?

Not on your life! Using his taste for intrigue and intimations of greatness to customary advantage, he ingratiated himself with a wealthy industrialist who gave him a job with travel expenses, lent him money and backed his growing political ambitions. Having anglicized his name by adding "Lincoln," Trebitsch ran for election to Parliament as the Liberal candidate from Darlington.

You guessed it. He won. This stealer of watches, this charming schnorrer from the banks of the Danube, now sat in Britain's House of Commons. But remember the old rap on the leopard about changing spots? It applies here. As consistently short of scruples as he was of money, Trebitsch Lincoln committed several acts of "financial irresponsibility" and blew another promising career. A colleague from this period said "He is thoroughly bad, a genius, and very attractive, but taking the crooked way always for choice."

Any scam artist worth his salt can smell a buck, and Trebitsch Lincoln's nose now led him to the oil fields of Rumania. Alternating his approach between Captain Bligh and Uriah Heep, he managed to finagle enough capital to form overlapping companies owning several pipelines. These went bust by the time the Great War began in 1914. He took flight again when the authorities got too close, this time to the Netherlands where he offered his services as an international spy to Germany, having already made the same offer to England. Laughed out of town, our peripatetic hustler took a boat to New York, published a book on his exploits, was arrested, extradited to Britain, tried and sent to prison. Upon release he talked himself into the middle of a revolt against the Weimar government.

You think that's outrageous? Wait till you hear this. The revolt failed; he skipped to Budapest and became a leader of the White Terror conspiracy against the Russian Revolution. When the action proved too slow he moved on to Vienna where he was apprehended, charged with treason and deported. He drifted to Rome, New York City, San Francisco, coming to rest in China.

Occasionally, the reader is forced to lift his head from the page and ask, "What have I got here, Terry and the Pirates? Reilly, Ace of Spies?"

Ignácz's garrulous affability hadn't failed him, however, and he soon found work as adviser to a Chinese warlord. He took a Chinese delegation to several European capitals to borrow money, was recognized and returned to China where he disappeared into the empty plains of the Orient. (Now he is Ronald Colman acting out the desperate scenes

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of *Lost Horizon*.) Finally he shows up in a monastery near Nanking where (are you ready for this?) he is ordained a Buddhist monk and takes the name Chao Kung. He is 52 years old.

This book reads as if Wasserstein had actually written a work of fiction after all. But is it a comedy or a tragedy?

Our last glimpse of I.T.T. Lincoln is in Shanghai in 1943, where he is being interviewed by a reporter for a Russian-Yiddish-English newspaper. He is dressed "in a black Buddhist robe, with soft Chinese shoes on bare feet, and a rosary around his neck." His head is bald, the beautiful brown eyes are dull, the handsome face has grown thick and sullen. He has studied the Jewish refugee problem, he tells the reporter, and has devised a plan whereby these unfortunates could be settled on a strip of land not far from the city.

Three months later, half a world away from the Danube, Trebitsch Lincoln died. Thomas Hardy insisted it is character, not event, that determines fate. Trebitsch fit the mold perfectly. Had Hardy met him in his travels, do you suppose?
William Dieter
Denver novelist

One Man's Owl
Bernd Heinrich
Princeton University Press, $19.50

On a perch in a Plexiglas cage in the Boston Museum of Science sits Spooky, a great horned owl. Spooky was brought to the museum as a helpless hatchling, spilled from his nest. He is now 37, almost blind from cancer and cataracts, subsisting meekly on catered meals of dead mice, and seeming not to give a hoot about the passing human parade.

Like many visitors to the Boston museum, I've often wondered how Spooky might have lived had wildlife rehabilitation techniques been well known in his youth. Now, thanks to naturalist Bernd Heinrich's impressive talents as caretaker, author and illustrator, I know what Spooky has missed.

As it happens, Spooky matches ethologist Heinrich's description of Bubo, subject of this delightful diary. Named for his genus, Bubo is a fellow member of Spooky's species (*Bubo virginianus*), one Heinrich found in a storm, its nest blown from the tree—a "sorry-looking bundle of misery."

Bubo and Heinrich shared a cabin in the Maine woods for three summers,

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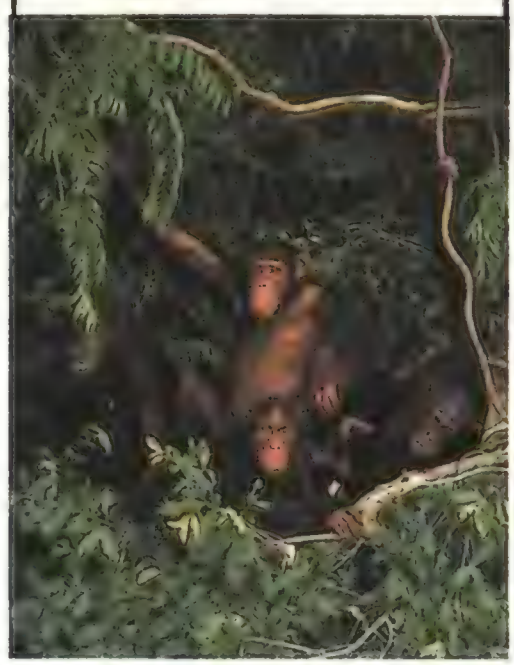

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ample opportunity for Heinrich not only to record the details of Bubo's evolving hunting behavior but also to develop a relationship of rare warmth with a wild and solitary creature.

Heinrich succeeds in promoting the former at the expense of the latter, in episodes that range from comic to harrowing to poignant. Bubo is hardly a born killer but he is helped to mouse meals galore by the Heinrichs' cat Bunny.

Heinrich tests his ward's developing discretion in selecting meals by proffering clams, windup frogs and toy bears. The clams are a success, but although the frog arouses some curiosity, the bear is not even examined. Bubo swiftly becomes, if not a skilled hunter, at least a fervid defender of his turf and his master. He nibbles gently at Heinrich's ear, yet swoops and screams at all others—Heinrich's wife included—with such untoward effects that Heinrich must post a Beware of Owl sign at the entry to his Camp Kaflunk.

Bubo's affection for his master is entirely reciprocated. As Heinrich admits, "Bubo had been tamed by me and I had been tamed by him, and now he is unique to me as I am to him." Yet, in the bird's interests if not his own, he sends Bubo to a raptor release center to prepare for return to the wild. Bubo flunks his course, however, and Heinrich not only rises to the training task but introduces two antagonists into the drama. Theo and Thor by name, they are crows Heinrich raises to test theories about mobbing of owls by crows.

The crows survive the experiment and Bubo grows into a predator worthy of his name. But Heinrich finds that the complex patterns of mobbing defy neat hypotheses. And Bubo's success—he weans himself away from Camp Kaflunk in his third summer—coupled with a spare limning of the breakup of Heinrich's family, leaves one fretting more for the author than for his owl.

Heinrich is far too self-effacing to want our concern. A champion distance runner, he passes himself off as a "fair-weather jogger." But modesty cannot conceal his scholarship or his sensitivity to nature. A man who grew up chasing deer through these woods for days on end, Heinrich captures his environment as securely as Bubo gripped his master's shoulder. And as a University of Vermont zoologist and author of both scholarly (*Bumblebee Economics*) and personal (*In a Patch of Fireweed*)

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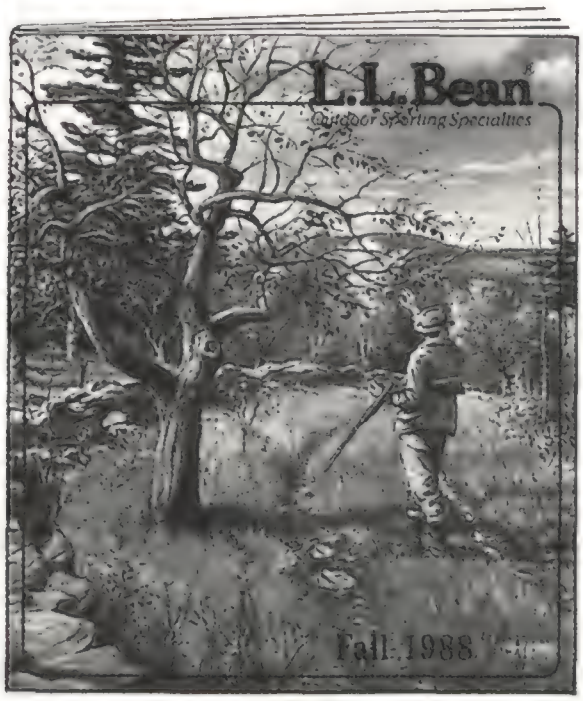

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1 oz.	butter	
1 oz.	sesame seed oil	
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Fresh black pepper (fine ground)		

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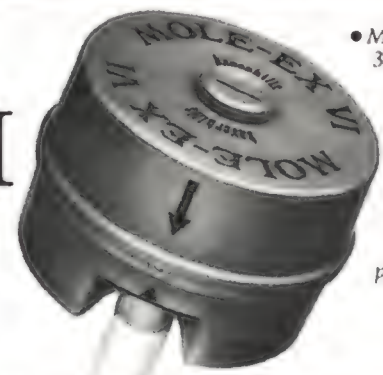

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naturalistic works, Heinrich smoothly merges anecdote with analysis, fitting together apposite observations from de Tocqueville, Goethe and Saint-Exupéry.

It is through Heinrich's own eye and hand that we learn of Bubo's behavior, and from those particulars go on to the larger truths of how owls work. For example, from Bubo's eclectic diet we discover not only the phenomenal digestive capacity of owls—they can eat 52 squirrels a year and liquefy a mouse in five minutes—but also the implications of this diet for the entire food chain of forest predation. For those who would plumb the owl's world even more deeply, Heinrich provides two appendixes and a lengthy bibliography.

For many of us who have wondered about Spooky and other owls, there is the reward of knowing Bubo, through Heinrich's wise and wide-open eyes.

Don Lessem
Boston-based writer and editor

Stranger in the Forest: On Foot Across Borneo
Eric Hansen
Houghton Mifflin, $17.95

The qualifications for undertaking a walk across Borneo include robust health, strong legs and, surely, a sense of humor—the self-deprecating sort, for preference. Redmond O'Hanlon did it, accompanied by poet James Fenton, and reported his journey, equally harrowing and hilarious, in *Into the Heart of Borneo. Stranger in the Forest* is a similar account by Eric Hansen, a young American.

The jacket of the book lists Hansen's background, including a degree from Berkeley, extended travels in the Middle East and Asia, and the familiar assortment of odd, sometimes *very* odd, jobs. In this context, buffalo catcher is not surprising. But Hansen has also worked, it appears, "as a barber in Mother Teresa's Home for the Destitute Dying in Calcutta." That seems to have just the right mix of exoticism, humanitarianism and incongruity for writing about a walk across Borneo.

Hansen is easy to like from the very beginning, when a Mr. Das tells him, " 'I am safe from crocodile.' He pulled up his trouser leg to display a large tattoo of a hook on his ankle. 'We Iban catch the crocodile with hook tied to bamboo raft. When crocodile see this hook—no bite.' 'What a good idea,' I replied, wondering if I could have a

facsimile drawn on my ankle with laundry marker."

It is just that sort of response—equally amused and respectful, daunted but unafraid, sensible but unwaveringly curious—that carried Hansen more or less safely across Borneo and back, and that makes this book, his first, one to remember.

"I had the good fortune," he writes, "of being able to make my plans in near-perfect ignorance of my destination." He did his homework, studying maps and journals and accounts of previous travelers, but the information available was either outdated or conveyed little of the island's realities. "It was not until I stood at the very edge of the Sarawak rain forest that I discovered most of the trails no longer existed and many of the longhouses were abandoned. It was then I also realized I had no idea what I was doing."

Admitting ignorance, he was forced to learn the language, the local customs of travel and trade and etiquette, and the survival skills needed in the forest. He learned to seek out the best advice, to absorb the rhythms of the land, and to make friends with people who knew of America only that it was far beyond the mouth of the river and required a great deal of rice to last the journey.

His tale is filled with adventure, danger, humor and suspense, but what elevates the story is Hansen's ability to observe carefully with Western eyes and yet to be one with this very alien world. When called on to beat some new village friends over the head with a live rooster, he pitches in with a will. Elsewhere he joins enthusiastically, if not with great skill, in community dancing.

He is equally zealous at describing dangerous and dishonest tribesmen and the horror of a village that has lost self-respect, but it is the Western world that most often fails the test of contact. Consular officials earn only scorn, missionaries win no praise at all, and the multinational timber companies are condemned for their wanton destruction of both land and people. Hansen ends his story with a report of tribesmen dressed in loincloths and hornbill-feathered caps, in 1986, stopping bulldozers with their blowguns. This marvelous book makes us see that our response to that image is among the most crucial decisions of our time.

Alan Ryan
Novelist and travel writer

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Smithsonian highlights

Planning a Smithsonian visit?

The Associates' Planning Packet, brimming with helpful information, is yours for the asking; call or send a postcard to Associates' Reception Center, Smithsonian, Washington, D.C. 20560; (202) 357-2700 or TDD for hearing impaired (202) 357-1729. Begin your visit at the Associates' Reception Desk, temporarily located in the Arts and Industries Building.

Festival of American Folklife

The 22d annual celebration, continuing through July 4, focuses on the traditional cultures of Massachusetts; how migration brought cultural diversity to Washington, D.C.; and Soviet and American musicians. Events take place on the National Mall between 10th and 14th Streets. For more information call (202) 357-2700.

Special July exhibits and events

Cooper-Hewitt Museum (New York)
Paris Opera on Stage: Designs, Costumes, Jewels (through September 25)
See *Highlights continued* (p. 145).
Annual Reports (July 5-September 25)
Some 150 examples show changing corporate environment and growing interest in sophisticated graphic design.
What Could Have Been: Unbuilt Architecture of the '80s (July 19-October 16)
The contradictions and hopes of American architecture.

National Portrait Gallery
Champions on Time (July 30-November 1989) *Time* cover portraits of American sports figures.

Meet the Meerkats.

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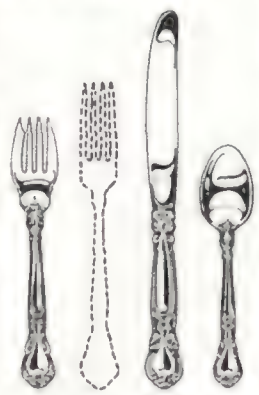
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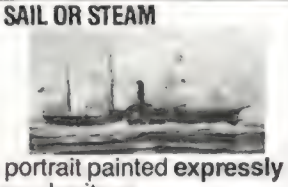
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National Museum of American History
Frank Lloyd Wright: In the Realm of Ideas (July 1-September 30) Artifacts, models, original drawings and a Usonian Automatic House illustrate Wright's achievements.
The Legacy Endures (July 1-December 31) Exhibit traces the history of the national waterfowl conservation movement.
"There's No Business Like Show Business": Irving Berlin's Centennial (July 23-January 31, 1989) Commemorates the 100th birthday of a beloved composer.

Hirshhorn Museum & Sculpture Garden
Russian and Soviet Paintings, 1900-1930: Selections from the State Tretyakov Gallery, Moscow, and the State Russian Museum, Leningrad (July 12-September 25) More than 90 paintings including work from the Russian avant-garde.
Different Drummers (through August 14) The special contributions of nine artists since World War II.

Arthur M. Sackler Gallery
Art of India: Painting and Decorative Objects (July 30-December 31) Stylistic and thematic examples of 13th- through 19th-century Indian art.

National Museum of African Art
Shoowa Design: Raffia Textiles from Zaire (through August 7) Complex geometric designs embroidered with raffia.
Images from Bamum: German Colonial Photography at the Court of King Njoya, Cameroon, West Africa, 1902-1915 (through September 6) Life in colonial Cameroon.

National Air and Space Museum
Fly-by-Night (Thursdays through August, 6-9 P.M.) Special demonstrations, tours and lectures for the whole family.
Focus on Flight (through August 31) Submit a photograph taken in the museum with an entry form listing rules from the Information Desk. Call (202) 357-2700 for more details.

Renwick Gallery
Clay Revisions: Plate, Cup, Vase (through September 5) Three traditional ceramic shapes as artwork.

Smithsonian on the air

Radio Smithsonian: Features on this weekly half-hour series include highlights of a performance on an ancient Chinese qin (a seven-stringed zither); an interview with an entomologist in the field capturing butterflies; and a discussion of the 1980s auction-house trade.
Here at the Smithsonian: Three-minute TV features focus on *Voyager* and other world-record-setting planes and on nine idiosyncratic artists.

To find out what stations in your area carry these programs write: Office of Telecommunications, MAH Room BB40, Washington, D.C. 20560.

Smithsonian Research Expeditions

Join Smithsonian scientists in the field. Volunteer for research in archaeology, folklore, volcanology and botany. For information call (202) 357-1350.

Exhibition catalogs

Catalogs available at this time include:
Frank Lloyd Wright: In the Realm of Ideas (paper, $24.95; cloth, $42.50)
Shoowa Design (paper, $24.95; cloth, $60)
Images of Bamum (paper, $15.95)
Different Drummers (paper, $15)
Masterpieces from Gripsholm Castle: The Swedish National Portrait Collection (paper, $10)
A Material World (paper, $5.95)

To order, send check or money order to Museum Shops, Box 44083, Washington, D.C. 20026-0083. Include 15 percent of total purchase to cover postage and handling (minimum, $1.75).

Smithsonian Institution Traveling Exhibition Service

SITES organizes and circulates exhibitions to cities throughout the United States and abroad. To sponsor a show in your community, write SITES, Smithsonian, Washington, D.C. 20560. Here are some July exhibits:
Cincinnati, Ohio (July 2-August 21) *Diamonds Are Forever: Artists and Writers on Baseball*, Contemporary Arts Center.
Flushing, New York (July 1-August 23) *Sharing Traditions: Five Black Artists in Nineteenth-Century America, from the Collections of the National Museum of American Art*, Queens Museum.
Los Angeles (July 16-October 9) *King Herod's Dream: Caesarea on the Sea*, Natural History Museum of Los Angeles County.
Sioux City, Iowa (July 30-August 28) *Mark Twain and Huck Finn: Joy-Flags and Milestones*, Sioux City Public Museum.

The fashionable Paris Opera

In Paris, opera means haute couture as well as hitting high C. "Paris Opera on Stage: Designs, Costumes, Jewels," appearing at the Cooper-Hewitt Museum in New York City through September 25, shows a 300-year evolution of contemporary fashion and theater design.

The Royal Academy of Music, founded in 1661, later merged with the Royal Academy of Dance, and the combined company evolved into the Paris Opera. Court dresses from the Palace of Versailles were worn in some early productions. Most of the original stage costumes were made in the Paris Opera House workshops, some requiring more than 100 hours of handwork to sequin and embroider. Today, the working wardrobe contains an estimated 50,000 costumes. Examples of these as well as pieces from the Paris Opera Museum are on display.

Designs for 54 costumes are also included, ranging from the lively paintings by Christian LaCroix for Charlie Mingus' *Les Anges Ternis* in 1987 to Paul Colin's proposals for the roles of the Flute, Violin, Trumpet and Trombone in the 1931 production of *L'Orchestre en Liberté.*

Six stage sets and 50 pieces of jewelry including exotic headdresses round out the exhibit, demonstrating that opera is also a visual spectacle.

Sally Scott Maran

Christian LaCroix's whimsical gouache was for *Les Anges Ternis* in 1987.

Gilded leaves adorned headdress by Charles Betout for *Le Lac des Aulnes.*

Paul Colin created "The Flute" for Sauveplane's *L'Orchestre en Liberté.*

A "Fury" appeared in this taloned gown in Jean-Philippe Rameau's *Zoroastre.*

An Egyptian crown with turquoise was used in several opera productions.

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Domestic Study Tours

Southwest Archaeology July 31-August 6: Excavate with archaeologists at Crow Canyon Center near Mesa Verde, Colorado. Novice and seasoned diggers welcome.

Colorado Rockies August 6-13: Spend a relaxing and informative week at a private lodge near Pikes Peak.

Lewis & Clark August 13-20: Experience the exhilaration recorded in their 1804 journals. By horseback, retrace their trail, still in its primitive state in northwest Idaho.

NEW By the Beautiful Sea—19th-century New England Resorts August 19-26: Sail the *Nantucket Clipper* to Woods Hole, Nantucket and Newport. Celebrate the Marine Lab's 100th anniversary.

Southwest Indians August 19-28: From Phoenix, travel through Hopi and Navajo lands; visits feature arts, crafts and dances.

Pacific Northwest August 23-September 3: An introduction to the natural beauty and cultural wealth of Seattle, Vancouver, Victoria and Puget Sound.

National Air and Space Weekend September 9-11: Explore air and space travel through tours and lectures with museum staff.

Wild California—Big Sur to Yosemite September 9-18: Enjoy easy exercise and spectacular scenery during naturalist-led hikes.

NEW White Mountains of New Hampshire September 12-21: A hiking adventure for outdoor enthusiasts.

West by Rail September 23-26 or 26-29: Travel by private, restored train from Denver to San Francisco or vice versa.

California Wine October 2-8: Learn to select, enjoy and evaluate wines from Napa, Sonoma and Mendocino.

Florida Keys October 20-28: Coral reefs, hardwood hammocks and tide pools are studied during a sojourn on Big Pine Key with marine biologists.

Okefenokee and Suwannee River November 2-7: For the novice or expert canoeist, a meander through this pristine area.

Foreign Study Tours

People's Republic of China Nine unique itineraries, July-October: Study archaeology, decorative arts; visit Nepal and Tibet. Tours for new and repeat China travelers.

European Countryside Programs July-September: Reside in scenic and historic areas of England, Hungary, Germany, Italy.

English Canals and Countryside August 4-16: Cruise through picturesque English and Welsh countryside on famous canals.

Tanzania-Kenya Wildlife Safari August 5-24: A unique wildlife excursion featuring the best of East Africa.

Volga River August 16-September 8: Cruise through the Russian heartland. Includes Moscow, Leningrad and a choice of excursions to Crimea, Georgia or Azerbaijan.

Adventure Voyage to Hudson Bay, Greenland and Iceland August 20-September 4: Designed for Contributing Members, a historic cruise with Smithsonian scholars.

Galápagos August 26-September 6: See the natural wonders of this Pacific island group aboard the M.V. *Isabela II.*

NEW Trinity Seminar August 26-September 10: Celebrate Dublin's millennium while residing at historic Trinity College.

European Waterways August 27-September 12: Aboard the *Argonaut*, cruise French rivers, coastal Spain and Portugal. Begins in London and ends in Lisbon.

Odyssey of Flight September 1-14: Visit aviation museums in Munich and London as well as the Farnborough airshow.

NEW Himalayan Kingdoms September 3-24: Hit spectacular heights in Ladakh, Nepal and Bhutan. Includes Delhi.

NEW Burgundy Walk September 8-22: Explore *à pied* the countryside and villages of Burgundy while staying in Autun, Dijon and Vézelay.

Oxford Seminar September 10-24: Celebrate Smithsonian's tenth-anniversary program at Oxford.

Yugoslavia September 13-27: Discover this gem on the Adriatic and its Oriental cities, medieval towns and seaside villages.

Switzerland by Train September 17-29 or October 1-13: Travel through the Alps to villages and cosmopolitan cities.

Canadian Rockies September 19-28: Glacial mountains, canyons, hot springs and great resorts beckon hikers to Banff, Jasper and Lake Louise.

Sicily September 23-October 6: Study this ancient island crossroad in the Mediterranean.

Rhineland October 4-20: Stay in Heidelberg before cruising the picturesque Rhine and Mosel aboard the M.S. *Europa*, pride of the Rhine River fleet. Tour ends in historic Cologne.

Japan Journey October 9-23: An excellent overview of Japanese culture in Kyoto, Tokyo and the countryside.

Australia-New Zealand October 16-November 8: An intriguing introduction to natural history and culture down under.

NEW Seminar in Egypt October 23-November 9: Lectures at American University in Cairo enhance a four-day cruise that visits ancient sites from Aswan to Luxor.

NEW India Arts and Crafts November 4-26: Unique program focuses on village artisans; includes trips to Agra, Ahmedabad and Bombay.

NEW Argentina November 6-27: Explore fantastic natural and historical diversity from the wildlife spectacle at Valdés Peninsula to remote parts of the panoramic northwest.

Thailand November 7-24: Enjoy colorful cities, remote villages and archaeological sites in this exotic country.

Write Smithsonian National Associates, 1100 Jefferson Drive SW, Washington, DC 20560 or call (202) 357-4700 for tour brochures

Washington

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Enjoy Vail's Old World style and unmatched beauty during these late-summer learning vacations high in the Rockies.

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Washington, D.C.

Aircraft Restoration, September 18-23
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Japan: The Shaping of Daimyo Culture 1200-1800, November 2-5
View this magnificent exhibition of Japanese lacquer ware, ceramics, screens, paintings and more at the National Gallery of Art. Take part in a traditional tea ceremony, attend a performance of Noh drama and enjoy illustrated lectures on Japanese art and society in this important period.

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Learn about the history, art and traditional cultures of the Siberian, Aleut, Eskimo and Northwest Coast peoples as you enjoy special tours and lectures that highlight the major exhibition "Crossroads of Continents" at the Museum of Natural History. Drawn from American, Soviet and Canadian collections, this unprecedented display of 500 objects represents cultural change from the Ice Age to the present.

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By Raymond Lovett

'Hey Leibniz, you wanna go for pizza?'

In my heady college days I fancied myself an intellectual. Fond memories of high expectation yet warm me, especially when I recall Philosophy 203, the History of Philosophy. Lesser mortals, superficial worldly types as we thought them, were involved in economics, math, literature. Let's face it, some even pursued carnal knowledge. Those of us with deeper instincts went for great ideas, the ideas that we, wise fellows, knew ruled the world. It was only a matter of time before, like Karl Marx, hungry and alone with his vision and his carbuncles, I would be shuffling in and out of some vast library, as Marx had done in London, creating a plan that might change history. Who knew, perhaps I'd come up with the intellectual link that would unite communism and capitalism.

My thinking place would be the library of my boyhood, Fletcher Free Library in Burlington, Vermont, where the Ray Lovett room would stand in permanent testimony. "Here the unknown Lovett studied daily, working on the oeuvre that has enriched the lives of many," the plaque would read, gold script on verd antique Vermont marble. Future thinkers would be stirred by the memory that the cognitive Muse had once visited this place. Scholars would come to look at the original drafts, a messy scrawl, crossed out, written over, discarded brilliance in the margins. I would be the Don Juan of the abstract world, giver and taker of the pure pleasure of deep, penetrating thought. I recognized the edge of Pride here but comforted myself with Emerson's "Nothing great was ever achieved without enthusiasm."

Two flaws in my character have thus far prevented me from that slab of verd antique. The first was the distraction of romantic musing. I was incapable of passing over any practical catchy phrase, sentiment or new idea without lolling around in its comfort. I brought a journalistic ear and grasshopper attention span to the work. Cosmological views remained vague, elusive, confusing, but Leibniz's pithy remark, "I often say a great doctor kills more people than a great general," stuck with me.

My professors, bespectacled, paunchy, bearded, were long on seriousness, short on humor. Fundamentals were imperative; discipline and daily study essential. Philosophical superstars were to be made, not born. As with batting and fielding, practice would bring excellence. The basics of cosmology, the study of time, space, ontology, epistemology, ethics, esthetics and rhetoric must be grasped before any original thinking should be even remotely desired. But we often put Descartes before the horses. We weasling philosophers desperately tried to incorporate our discoveries into daily life, reducing them to the easily digestible. Finding a new pizza place for our 10 o'clock break or getting a date with a desirable woman was greeted with "How Cartesian of you." We renamed our most studious colleague, "Doctor Cogito Ergo Sum."

Hegel's famous historical trilogy—thesis, antithesis, synthesis—we turned into a double-play combination. Schopenhauer to Kierkegaard to Nietzsche. Hobbes was our earthy realist with his notion that every man is a wolf to his fellow man. Linebackers were Hobbesian. And there were always some lowbrow mnemonics like "Nietzsche is peachy, but Freud is enjoyed."

Midway through the semester hope of making it in the deep-think fast lane waned considerably. The fundamentals—metaphysics, cosmology, epistemology—were difficult to keep separate. What kind of baseball player had trouble separating a hitting technique from a catching skill? We feigned camaraderie with the thinkers, assigning identities to one another. "Hey Spinoza, you monist, where's your dynamism?" "If Leibniz were here, he'd know what to do." "The Red Sox traded Schopenhauer, too slow on the bases." "Husserl for President." For a month or so I was called Leibniz, an accolade that, I swear, helped me during homework. As we grew more desperate we adopted first names. We also quoted our heroes at lunch. "Gottfried Wilhelm (Leibniz), pass the salt." "To marry is to halve your rights and double your duties." Sure thing, Art (Schopenhauer).

"Custom, then, is the great guide of human life." Righto, Dave (Hume).

"The only fence against the world is a thorough knowledge of it. Do you agree, Baruch (Spinoza)?"

"Not quite, Jack (Locke). Experience more than sufficiently teaches that men govern nothing with more difficulty than their tongues."

Naturally, Nietzsche always got the last word. "When you look long into an abyss, the abyss also looks into you."

The second cause of my fall from aspiring philosopher was a whopping failure to be appreciated. In any group, few showed interest in Schopenhauer's dynamic monism and Nietzsche's superman. In other words, all the girls treated us as freaks.

I do not mean to appear resentful. After all, we were taught, weren't we, to be philosophical about such treatment. We hardly noticed our conversion to hedonism. Women, career, marriage, children, mortgages and tuition swiftly replaced abstractions and the speculative frame of mind. The memory lingers though, sometimes warming to a comforting grin when I hear again, in my mind's ear, those playful words, "Hey Leibniz, you wanna go for pizza?"

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